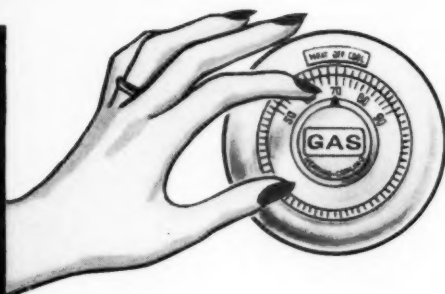


AMERICAN GAS ASSOCIATION

Monthly



MAY
1961



DEPENDABILITY

The most important feature in air conditioning today!

And a Bryant Gas air conditioning system is *truly* dependable.

Because it's Gas, weather will not disrupt service, especially on hot, hot days when it's needed most. Because it's Gas, neither you nor your customers will be bothered with excessive costs, excessive maintenance. For

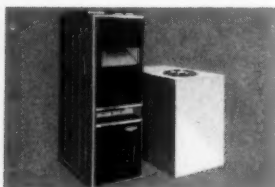
example, a Bryant add-on Gas cooling unit installs outdoors, uses no high amperage wiring, no valuable floor space, no water tower. And, because it's Bryant, you are backed by a company with over 50 years experience in home comfort . . . now a leader in air conditioning.

Bryant Gas air conditioning can be depended upon to furnish *whole* house comfort—all year round. And *nothing* cools more comfortably, more quietly, than Gas. Ask your Gas company for details.

AMERICAN GAS ASSOCIATION



Bryant Gas air conditioning cools with an even flow of air, filtering out pollen and dust. Responds instantly to temperature changes—operates quietly.



A flip of one switch gives *coolness* in summer, *warmth* in winter—with compact Bryant Gas furnace (*fits in closet-size space!*) plus Bryant add-on Gas cooling unit.

**LIVE MODERN
FOR LESS
WITH...**


GAS



Photo from **LIVING** for Young Homemakers magazine, which designed kitchen with cooperation of A. G. A. Home Bureau

THE Future Belongs to Gas" say Southern California and Southern Counties Gas Companies in their advertising (story on page 13). . . . If so, the credit must go to gas industry research. . . . Of the many marvels now being brought to birth in our industry, perhaps the most startling and dramatic is the gas-operated generator of electricity . . . This is a development by which gas promises not only to overtake, but to take over the competition—lock, stock and kilowatt. . . . Of course, this is taking the extreme view—we know that in view of the nation's growing power needs, all of the major energy industries will be around for a long time to come. . . . Still, it is a thrill to beat a formidable competitor at his own game . . . and if the gas fuel cell provides a really low-cost and convenient source of electricity, that is just what the gas industry will be doing. . . . You'll find the story of current research and development on the gas fuel cell on page 11. . . . Moreover, so dynamic is gas industry research that it has spawned not just one electricity-producing device, but four. . . . Others are the thermoelectric generator, the thermionic converter, and the magnetohydrodynamic converter. . . . These are mentioned briefly on page 13, and it will be the policy of the MONTHLY to bring you as much further news of these developments as possible in future issues. . . . A wide range of further scientific and technical advances was covered at last month's Research and Utilization Conference. . . . That story is on page 6.

JAMES M. BEALL
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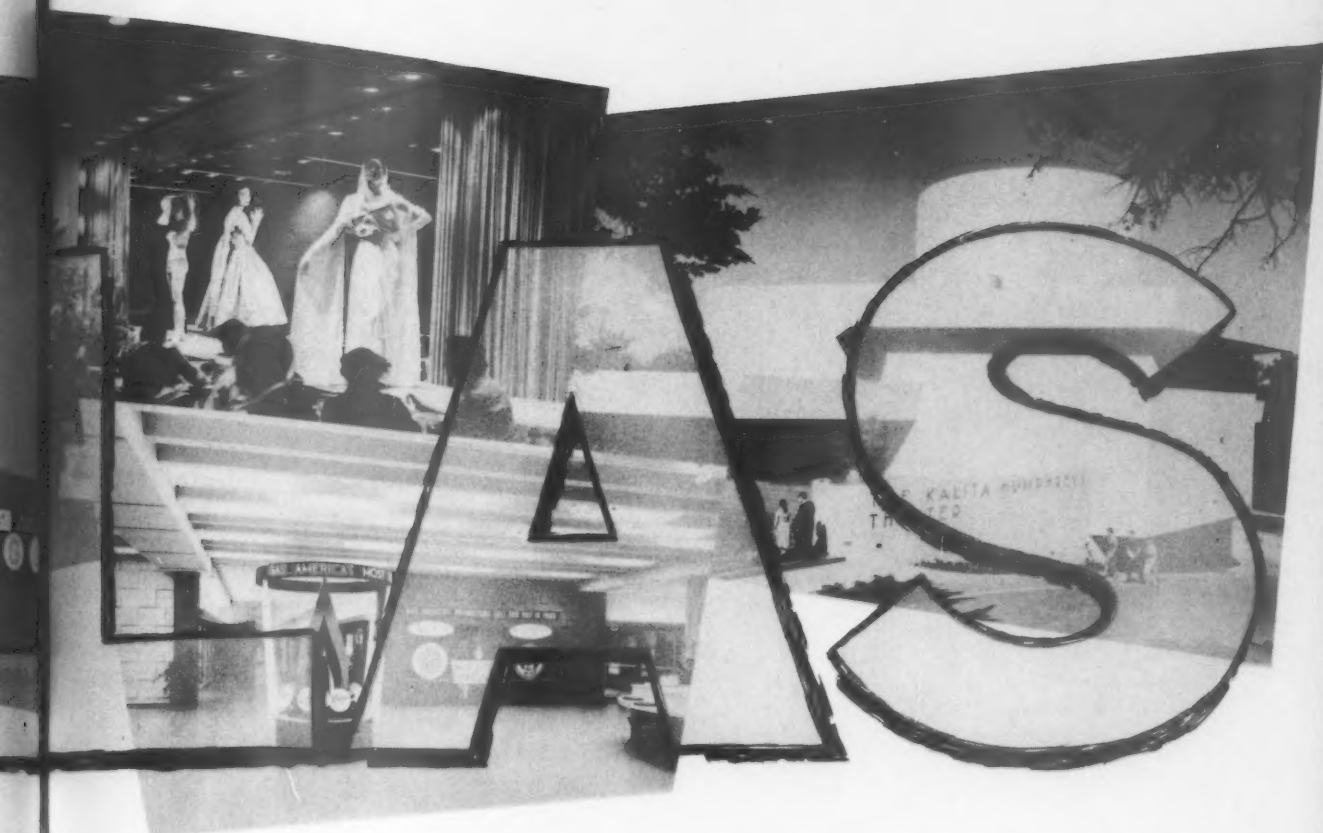
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Ladies' events, theatres, restaurants are among A. G. A. Convention attractions

be transported in buses to the Dallas Trade Mart for a buffet luncheon, followed by a business program sponsored by the A. G. A. Home Service Committee. At the end of the program, all ladies will be taken on a tour of the Gas Appliance Center at the Trade Mart, and returned to their hotels by mid-afternoon. Another highlight, the Home Service Breakfast, will be held at the Baker Hotel on Tuesday morning. A special luncheon and style show will be held for the ladies on Tuesday.

Social high point of the Convention will be the President's Reception, Entertainment and Dance on Monday evening, October 2. This year's Reception will be entirely different from any that A. G. A. has sponsored previously, and is being designed as an informal Texas style party, with dancing and entertainment.

Convention activities will conclude on Wednesday morning, with the third General Session, followed by a General

Luncheon in the ballroom of the Statler Hilton hotel. This luncheon will end no later than 2:30 p.m. so that delegates and ladies can catch planes and trains.

The following chairmen are working on major phases of the Dallas Convention:

General Convention Committee—L. A. Bickel, vice president, Lone Star Gas Company.

Entertainment Committee—David J. Kerr, executive assistant, Southern Union Gas Company.

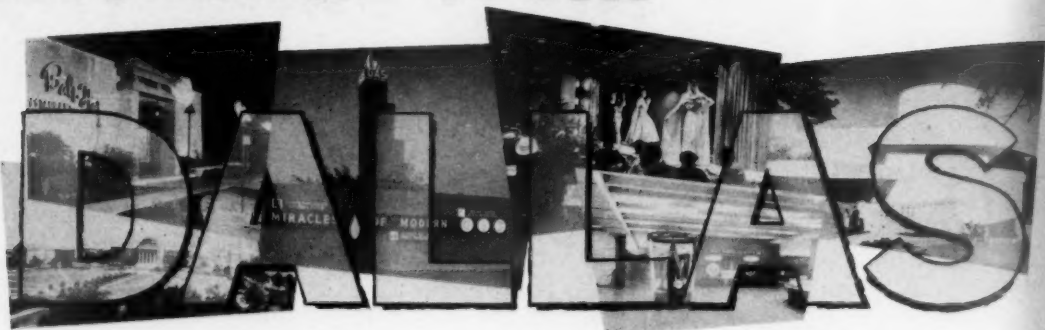
Publicity & Attendance Promotion—Neal Hall, director of publicity and advertising, Lone Star Gas Company.

Transportation—D. A. Hulcy, Jr., manager, building management department, Lone Star Gas Company.

Welcoming Committee—David J. Kerr, executive assistant, Southern Union Gas Company.

Club Memberships—Fred D. Bradley, assistant treasurer, Southern Union Gas Company.

'Dividends from



By L. A. BICKEL

*Chairman, A. G. A. General Convention Committee
Vice President, Lone Star Gas Company*

Large dividends from Dallas await gas men—and ladies—who plan early and effectively for the October A. G. A. Convention.

The International Association of Convention Bureaus estimates that in 1957 more than ten million delegates attended 20,000 national, regional and state conventions. The average stay in the convention city by delegates to all types of conventions was 3.84 days and the average delegate spent a total of \$118.61.

You wouldn't think of investing \$118 in equipment without studying specifications and planning your purchase well in advance. The same applies to conventions. To maximize the return on your convention investment, you should plan your attendance and your schedule months in advance of the convention.

One gas industry president stated it as follows: "If the meeting is worthwhile, it justifies extra effort on our part to insure the success of our participation."

Here are some steps you as a gas company executive can take to assure maximum dividends on your company's investment in the Dallas Convention:

- Designate someone at the management level to handle your company's reservations for the Dallas Convention.
- Make certain that not only top management, but key middle and lower management people are given the opportunity to attend. Which employees will benefit most?
- Require your Convention delegates to prepare memoranda on specific problems, things to see, and people to meet, prior to the Convention.
- Instruct your representatives to study the advance program beforehand. This will help them to budget their time and to attend those meetings that are most important to your interests.
- Urge your people to check the list of PREregistered

delegates for friends and persons interested in the same problems.

- Encourage your delegates to plan their schedules so they can spend adequate time with old friends and new acquaintances in old-fashioned bull sessions. Many valuable tips are gained from such informal contacts.
- Instruct each delegate to list all new acquaintances he makes at the Convention and persons he wants to contact when he returns home.
- Encourage your married men to bring their wives. Some companies even pay the Convention expenses of delegates' wives. You will find that many ladies are sincerely interested in the gas business and want to learn more about it.
- Encourage your people to broaden their knowledge of the gas business. If they're in sales, they shouldn't ignore technical phases of the Convention. If they're technical men, they shouldn't devote all their time to technical matters. They should mix it up at the meetings, and get away from their own crowd and talk with people from other delegations.
- Encourage your people to take notes on what they see and hear. Encourage them to do more than sit and listen to speeches. As a speech proceeds, they should try to apply what the speaker says to their own problems and situations, and take mental notes of points they want to talk over later with the speaker or others in the audience.
- When your Convention delegates return to home base, require them to report on what they saw, what they learned, and how to apply this knowledge. Instead of a written report, some companies hold staff meetings or require verbal reports to department heads.

Yes, Mr. Delegate: This Convention *is* necessary! It will meet definite needs. It promises to be the inspirational high point of our business year, an unexcelled opportunity to exchange ideas, hear nationally known authorities, and to return home with recharged enthusiasm for the gas business.

Plan now so you and your associates will enjoy "Dividends from Dallas!"



Downtown Cleveland, where gas utility will build a multi-million-dollar central plant for area heating and cooling

Cleveland next for 'piped cooling'

The East Ohio Gas Company is preparing preliminary plans for a large, self-contained heating and cooling plant for Cleveland's downtown Erieview Urban Renewal Project.

A similar undertaking already is underway in Hartford, Conn., where the Hartford Gas Co. is building a three million dollar plant to supply chilled water for cooling and steam for heat of a downtown urban renewal project similar to Erieview.

The Cleveland plant would be the second, and largest, in the nation.

The Hartford Gas Company will supply summer cooling and winter heating to an area where three major office buildings, a shopping center, a 250-room hotel, a new broadcasting center and several multi-million-dollar high-rise apartment buildings are planned.

East Ohio's plans call for a single plant, located somewhere in the Erieview area, which would supply heating and cooling for the buildings to be constructed in a 190-acre tract in the heart

of the city.

In effect, East Ohio, instead of selling natural gas for heating and cooling, would be expanding its operation to selling heating and cooling itself, as will the Hartford Gas Company.

Robert W. Ramsdell, East Ohio president, said that the company expects that the project will cost between five and 10 million dollars, depending upon the size and number of buildings which will become part of Erieview. He pointed out that in any event, the plant and all necessary piping would be so designed that it could be expanded to meet the needs of the future.

The Erieview plan, drawn by I. M. Pei, noted New York city planner, calls for the razing of all eyesore buildings and the construction of a shopping center, hotels, high-rise apartment houses, office towers and parks.

The city is condemning whole blocks for the projects, preparing for demolition. When the land is cleared, it will be sold to the highest bidder who

pledges to construct the type of building called for by the plan on the site.

Cleveland voters have authorized a \$3,000,000 bond issue for Erieview and the city has another \$2,000,000 available from other sources. The federal government will match the city's expenditure on a two-to-one basis.

As much as \$200,000,000 is expected from private investors who will build on the cleared area, prime downtown land available at fairly reasonable prices.

Mr. Ramsdell sees the East Ohio project as an added incentive to investors.

He points out that the single heating-cooling plant concept completely eliminates the need for each Erieview building to have separate heating and cooling facilities.

Besides doing away with the initial costs of purchasing and installing heating and cooling equipment, the single plant plan would eliminate operating and maintenance costs for building owners. In addition, space that would

(Continued on page 30)

Speakers at the Tuesday afternoon session, grouped left to right, are: R. Siskin, W. R. Sarno, H. G. Hill, J. Maas, and J. F. McDevitt



Tuesday morning: (front) W. G. Hamilton, Jr., L. T. Potter, P. J. Reynolds, (rear) C. L. Elliott, R. L. Stone, J. C. Darrow, and W. H. Loving

Wednesday morning: (front) E. B. McConnell, J. C. Darrow, J. M. Singer, (rear) P. J. Reynolds, G. N. Hatsopoulos, E. B. Shultz, Jr., J. Jansen



*Research and Utilization Conference
previews dramatic developments in appliances,
briefs delegates on scientific advances*

Research puts gas on threshold of new era

A preview of tomorrow's gas appliances and their coming impact on the industry was presented to more than 450 representatives attending the Research and Utilization Conference at the Sheraton-Cleveland Hotel, Cleveland, April 4-6.

With the accent on heating, more than a dozen speakers discussed supplemental and central heating appliance developments which are improving the competitive position of gas. In addition, talks covered advancements in such fields as air conditioning, incineration, and thermoelectric and thermionic devices.

In the keynote address at the opening session, W. G. Hamilton, Jr., stated, "The job of keeping us modern is in your hands."

Expanding on his topic, "The Job of Remaining First," he noted dramatic developments in gas appliances and achievements which place the industry on the threshold of a new era.

Looking at tomorrow's homemaker in the light of continuing economic and

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Thursday morning speakers were: (front) W. B. Kirk, M. J. Caparone, R. M. Mitchell, M. F. Knoy, (rear) J. C. Griffiths, and Julius Klein



Wednesday afternoon speakers at table, left to right, are: S. C. Marshall, R. L. Evans, H. J. Burns, P. J. Gratiaa, and E. T. Selig



"Flame-thrower" range top pilot light is given once-over by Conference representatives during their tour of the Cleveland Laboratory

scientific advancements, he declared, "It is my firm belief that as the desires and demands of the market move upward, purchasers' emphasis will move more and more towards quality appliances and equipment. In the long run—and starting now—we must recognize that the quality of our appliances and equipment is the norm by which the consumer will judge the quality of our fuel."

In closing he urged the industry not to lose sight of the fact that three basics—design, construction and performance—must be the chief factors in the gas industry's progress.

During the remainder of the morning, speakers presented papers on various aspects of gas heating. C. L. Elliott, Cincinnati Gas and Electric Co., outlined advances in localized area heating equipment. Noting the fact that supplemental heating problems increasingly are being solved by the use of electric heaters, he described two exciting infra-red gas heaters being developed to meet this challenge—one for bathrooms and one

a direct fired baseboard convector heater.

Gas vs. electricity for residential heating were compared in a paper given by W. H. Loving, Washington Gas Light Company. Available data on the subject was presented in a brief bibliography. After breaking the estimated fuel requirements for home heating into simple arithmetic and drawing an analysis of comparative costs, he declared, "If owning and operating costs governed all decisions, very little electric heat would be sold."

Placing emphasis on the need for promotion and selling, he expressed hope that "a few of you will find, at this conference, some aid and comfort to help you in the great job which lies ahead."

Final speaker for the morning, R. L. Stone, William Wallace Company, spoke on "Compact Heat Exchangers vs. Thermal Stress Fatigue—New Dilemmas for Designers." Current projects undertaken in this field by the A. G. A. Laboratories and Battelle Memorial Institute were detailed along with discussions of their

value in indicating how close the designer is to practical limits of heat transfer, or to possible problems in thermal stresses due to the shape and material of the heat exchanger. From these projects and related research "the entire gas industry will reap the benefits of being provided with more efficient and more durable compact gas appliances," he stated.

At the Wednesday luncheon, L. T. Potter, president of A. G. A. and Lone Star Gas Company, echoed the theme of the keynote speaker in his address, "Research: Our New Clarion Call."

"We need to reach out in our planning and point out where we are going," he stated.

"Out of research and the joint efforts of management and technicians will come a better today and a brighter and new tomorrow," he declared.

Resuming the discussions on gas heating Tuesday afternoon, H. G. Hill, Union Gas Company of Canada, Ltd., discussed modulated heat supply for

homes. Results of a study in the field of house heating system performance were presented. These included combustion efficiency, blower operation and heat distribution data gathered in a series of tests conducted on an average home. Conclusions of the study indicated that modulated heat can substantially improve comfort in homes where forced air heating is installed. Of greater significance, Mr. Hill stated that "from present information it would appear that the gas industry has a substantial advan-

by gas companies for their own use.

"Exciting air conditioning advancements are being made on all fronts," C. W. Wilson, Baltimore Gas and Electric Company, reported. "The number of companies manufacturing gas-operated cooling equipment has tripled in the last seven years," he declared. These include a number of companies with new equipment under development in both residential and large tonnage industrial and commercial sizes.

One of the most dramatic innovations

developed by Battelle Memorial Institute," J. F. McDevitt, Philadelphia Electric Company, reported. In the summary and conclusions of the project he stated, "This program has developed an instrument that can give reliable, repeatable results when determining the odor intensity of the domestic gas disposal effluent."

This instrument eliminates the former method of determining odor of the gases by smell and allows objective testing that can be reliably compared to a

Gas lamps, lined up for experiments to minimize glass discoloration and test effects of on-off cycling and ignition methods on mantle life



Through-the-wall radiant heater on display at Labs for Conference-goers' tour



tage over the oil industry in regard to modulated heating of homes. This advantage may be the deciding factor in convincing owners to change to gas when oil-fired equipment becomes obsolete."

"The electrical industry has not justified its claims for heating with a heat pump or by resistance systems," W. R. Sarno, A. G. A., told the conference.

In a discussion of "Gas Heating Estimates: The New Way," he outlined data developed from a field study of gas and electrically heated homes in four climate areas. Limitations of the degree-day method of estimating annual fuel consumption were pointed out, and the desire for more satisfactory correction factors were explored in the study.

Presenting the procedures used and their merits in heating evaluation, Mr. Sarno detailed the new multiplier method, which will permit an evaluation of estimating procedures developed

is a current study of the feasibility of adapting gas turbines for air conditioning use. This study is being conducted in cooperation with the Solar Aircraft Company.

"Application of the turbine for air conditioning is only one of many which are possible due to the turbine's extreme versatility," he stated. "The gas industry is also aware that with the turbine as a prime mover, it has the rare opportunity of supplying the total energy needs—including electricity—for buildings such as hospitals, schools, factories, and a host of others," he added.

Extending present knowledge to the somewhat distant future, he raised hopes that recent research on thermoelectric materials and fuel cells may provide a means of developing a gas "window unit" air conditioner to compete with electrically-driven units of this type.

"An instrument for objectively testing odors emitted by gas disposals has been

standard or to another incinerator. Combined with objective testing for smoke emitted by disposals, this will provide a comprehensive and positive evaluation of smokeless-odorless disposers.

Controls that have been successfully applied to commercial laundry equipment to prevent overdrying were shown in a series of slides by J. Maas, Controls Company of America. Citing the fact that many housewives have accepted forced drying of clothes by heated air, he stated, "The development of completely automatic controls for dryers has lagged and to some extent this lag may be responsible for lack of total acceptance."

In a comparison of factors to be considered in selecting the drying time for commercial and residential dryers, he pointed out the extreme variations in home laundry loads. This factor has limited the reliability of time controls and made development of other types of

controls a requirement for total acceptance of home dryers. The new controls based on humidity and direct moisture sensing that have been developed and successfully applied to commercial equipment can with modification be applied to residential dryers, he added.

Departing from the conventional gas appliances of today, a number of speakers gave exciting papers on future applications of gas.

Among these were "Natural Gas Fuel Cells for Power Generation in Dwell-

tailed and costs per watt were presented.

In considering costs, he stated, "Up to the present time, devices have been assembled by skilled technicians, however, this assembly could easily be performed by unskilled girls and, at a later date, by semi-automation."

Citing the rapidly decreasing costs per watt, he predicted that by 1964 devices will be available that can produce electricity for as little as a nickel a watt.

G. N. Hatsopoulos, Thermo Electron Engineering Corporation, announced that

appliance manufacturers and government bureaus included: "Carbon Formation in Very Rich Hydrocarbon-Air Flames," by J. M. Singer, U. S. Bureau of Mines; "Research Points the Way to Reducing Heat Losses to the Kitchen," by W. B. Kirk, A. G. A. Laboratories; "Pre-Adjusted Gas Ranges," M. F. Knoy, Boston Gas Company and J. Klein, Caloric Appliance Corporation; and "Results of A. G. A. Research on Cathodic Protection of Gas-Fired Water Heaters," R. C. West, Case Institute of



Ceiling mounted infra-red heater was demonstrated for Conference by A. G. A. Labs



Research & Utilization men spent afternoon at Labs, viewing research demonstrations, combination appliances, equipment testing displays

ings," by E. B. Shultz, Jr., Institute of Gas Technology. In part he stated, "If natural gas can be used as the energy source, fuel cell power packs may be economic for supplying all or most of the electricity requirements of a home. In many areas of the country, a unit of energy in the form of gas costs the residential consumer only one-sixth to one-eighth as much as a unit of energy in the form of electricity. It seems likely that this basic cost advantage will be large enough to offset the unavoidable additional costs in converting energy to electricity in a multiplicity of small installations."

J. Jansen, Transitron Electronics Corporation, discussed thermoelectricity utilization by the gas industry, outlining present research into various applications.

Types of generators, comparative sizes for operation of fans, blowers, pump motors for gas appliances were de-

velopment of a 200 watt natural-gas-heated thermionic converter is presently in progress by his company under joint sponsorship with A. G. A.

"The design of the generator, as now conceived, will have such flexibility that with minor modifications it can be used in the fabrication of units ranging in power from 50 to 10,000 watts," he stated.

Remarking on the potential applications of such a device, Mr. Hatsopoulos cited the need for low-maintenance electric power supplies for remote locations and for units to generate emergency power for homes, hospitals, communications and safety networks.

"In the future," he added, "there can be all-gas houses and factories which will have large thermionic converters to supply all the necessary electricity and heat from gas."

A series of reports on research projects conducted by A. G. A. Laboratories,

Technology.

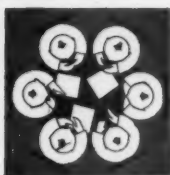
Most of these projects are continuing and papers were presented to bring the conference up to date on current results and give an analysis of the programs.

Research efforts on ignition problems have led to development of draft resistant pilots and battery powered transistorized spark ignition systems. Several electric ignition systems constructed at the A. G. A. Laboratories were explained by S. C. Marshall, Minneapolis-Honeywell Regulator Company.

A pilot which incorporated a close mesh screen as its burner head remained lit under imposed steady drafts exceeding nine miles per hour. By way of comparison, the same pilot, without the screen, was extinguished by a five-mile per hour draft.

The study also revealed that primary aerated pilots were more stable under concussion conditions, which extin-

(Continued on page 26)



Industrial relations round table

Prepared by
A. G. A. Personnel Committee

Edited by **W. T. Simmons**

Assistant Personnel Manager
Philadelphia Electric Co.

● **Make the most of your manpower**—Putting pegs into holes is a child's game. The executive plays it too; only for bigger stakes. He is trying to fill the many jobs in his organization with people, and the success of the company is the prize.

Business organizations are made up of people who perform numerous jobs. Some men will be locked in the immaculate confines of a laboratory working on the ideas that will form tomorrow's products or services. Others will be balancing the debits against the credits or placing new service lines to houses. The number of jobs within a company are many. And each job makes different demands upon the person who fills it.

The Management Letter of January 2, 1961 in *Electrical World* states that the first rule is to know the job to be filled. This means sitting down and spelling out the job requirements in detail. Not only do different jobs make varying demands upon the people who fill them, but also jobs with the same title in two different companies are apt to be very different in nature.

After formulating the job requirements, we turn to the individual. What kind of person is needed to meet the requirements of the job? First, we need to know about the specific educational background, and the area of past experience.

Aside from education and experience, there are several other criteria. Certainly, for most jobs, good health is a prerequisite. Conceivably, even temperament could be important. A job that applies constant pressure to the individual needs a strong nervous constitution. If the person chosen will be supervising or coordinating the activities of the district, division, or section, you will need someone with managerial ability. Here, the job will call for experience in handling people, in setting standards, in appraising performance, in the many managerial activities.

Since requirements vary from job to job, the man requirements will vary also. The Management Letter goes on to say that while this may seem obvious, the peculiar demands made by each job are frequently overlooked. Some companies feel that there is a "company type" who is suited to all jobs within the firm. They painstakingly prune the field of job applicants in search of this ideal creature, and are cautious to eliminate anyone who varies ever so slightly from the mold. This approach might be valid if all jobs in the company made essentially the same demands on the individuals who perform them. But this is true of a limited number of operations at best. In the majority of companies, many

different activities are in process. And the requirements for jobs in research and development are quite different from those in public relations and sales. Consultants at Commonwealth Services, Inc. feel that it is essential for the executive to formulate a definite list of man requirements before he begins looking for the man. Otherwise, it becomes a search for a vaguely defined person to fit a vaguely defined job, with little chance of real success.

After formulating your man requirements, you can put the job requirements into the desk drawer. That is because the man requirements should give you a fairly detailed description of the person for whom you are looking. But the problem is only started. The big question still remains. Where to find the man?

The first place to look is in your own department. People who have some managerial experience within the department know the system. They are well aware of its strong points, and equally versed in its shortcomings. At least in theory, they should be able to make the transition to the new job more easily than someone strange to the workings of the group. Of course, there is a bonus benefit to promoting from within. Other men in the department have a pointed illustration that good performance is rewarded. They will work all the harder in order to be ready by the time the next position opens. And finally, if a manager has been looking ahead, then promoting from within his own organization is a simple process. That is because he has projected his personnel requirements for several years into the future. When an important job opens, the man to fill it is waiting in the wings.

One way of projecting personnel requirements is with an organization development chart. This chart shows the organization graphically, supplying pertinent data on each individual, plus some indication of his promotability. This type of projection, when kept up to date, makes the filling of a vacancy less complicated and better organized. Potential replacements can be spotted long in advance and developed for promotion.

But even with such a projection, problems can arise. First, the chart does not create men; it merely follows their progress. It is quite possible that when a job opens, the executive may look at the organization development chart, and find that there is no one ready to assume the position. Or, perhaps, the man next in line is unable, or unwilling, to assume the new responsibility. Many departments have lost a promising replacement due to accident or poor health. In such a situation, managers who have planned ahead find themselves suddenly with a job to fill. They must begin a "manhunt" outside their department. Where do you get the facts on outsiders?

The personnel department of your company should be able to supply the answers. Naturally, they cannot make the decision for you. This is a management responsibility

that should not be delegated. But if personnel has been doing its job, it is in a position to supply you with all the raw material you will need for your decision. When personnel records are up to date, they should contain a wealth of data. First of all, they will list the educational background of each person, giving not only his education, or certificates of completion, but also his areas of particular interest. Then, they will list the jobs he has held in the past, both outside and within the company, and any special training he has taken which is related to the activities of the company. Some companies believe that the personnel record should contain a periodic review made of the man's performance by his superiors. Other companies are ready to debate this practice, stating that the constructive changes should have been brought to the attention of the employee at the time the changes were first noticed. Waiting six or twelve months to record the problem can provide a permanent and damaging history without benefit of improvement during that time.

Commonwealth Services' consultants feel that these reviews are perhaps the best indicator that the executive can use in making his choice. They offer a suggestion on how to make the reviews even more helpful.

In any appraisal of a man written by a superior, there can be two shortcomings. The first short shortcoming is due to personality differences between superiors. One manager may make all his appraisals favorable, varying only in the case of an exceptionally deficient person. Another manager may be quite conservative in his praise, using superlatives only to describe the outstanding. So, two men working for different managers may perform in the same fashion, but receive different evaluations due to the manager's way of expressing himself. Another danger is that simple personality conflicts may mar the objectiveness of such appraisals. It is easier to write nice things about someone you like.

To escape these pitfalls, Commonwealth advises that these reviews be made on a committee basis. This means that several of a man's superiors, his immediate boss as well as other managers familiar with his work performance, prepare the report together. In this type of session, supervisors are compelled to cite reasons for their opinions. Reports coming out of such committees are more likely to be free from personal prejudices.

Psychological testing is gaining importance in the business world as an accurate method of measuring those "intangible" qualities. The man's aptitude for the work, his motivations, his ambitions, and many other dark areas in his make-up are being illuminated to a great extent by such tests. But there is a danger.

Testing can be over-emphasized. In fact, some companies let the tests make the decisions for them. When a position opens, they go through the process of interviewing, study-

(Continued on page 16)

*Four top engineers report progress
on method of generating electricity from gas*

From fuel cell—power for homes?

By E. B. SHULTZ, JR.
K. S. VORRES
L. G. MARIANOWSKI
H. R. LINDEN

In recent years, fuel cells have been rapidly becoming more important in the plans of a number of industries, as well as in military planning. At present, over 60 industrial and government fuel cell projects are known, expending millions of dollars annually.

An ever-increasing number of types of fuel cells are in development to meet specialized future needs of the electrical, electronic and battery industries, the automotive industry, and military and space agencies. In addition, fuel cell work related to production of electricity from coal has been done, and another energy-oriented group, the petroleum industry, has some of the most important fuel cell research and development programs of the present.

The gas industry is also presently active, through American Gas Association-PAR Plan sponsorship of research on natural gas fuel cells at the Institute of Gas Technology. This report will review current progress of this project and related engineering-economic studies, which are directed primarily toward the development of fuel cell power packs for dwellings, to supply all or most of the home needs for electricity.

If natural gas can be used as the energy source, fuel cell power packs may be economic for supplying all or most of the electricity requirements of a home. In many areas of the country, a

unit of energy in the form of gas costs the residential consumer only one-sixth to one-eighth as much as a unit of energy in the form of electricity. It seems likely that this basic cost advantage will be large enough to offset the unavoidable additional costs in converting energy to electricity in a multiplicity of small installations. This should be possible primarily because of the relatively high efficiency and low unit cost of small fuel cell systems. The low cost of transporting and distributing energy to the consumer's home in the form of gas would then make possible the convenience and versatility of a single source of heat and electrical energy in an all-gas home.

Possible approaches

At this time, the direct electrochemical oxidation of gaseous methane does not appear practical because of its low reactivity in fuel cells of all kinds. However, there are two demonstrable approaches for overcoming this problem.

Even though methane alone will not oxidize rapidly enough, it is still possible to use it "directly" in a high-temperature fuel cell, if steam is present. Since tests have shown that bone-dry methane does not react, but that steam-methane mixtures do, it is assumed that steam reforming occurs on the anode surface, and that the observed current is due primarily to electrochemical oxidation of hydrogen produced as a reactive intermediate, at cell temperatures in the range for catalytic steam reforming and carbon monoxide shift.

Two types of electrolytes have been used in these high-temperature cells: molten carbonate mixtures, and solid ionic oxides. The carbonates have received the most attention in prior work,

by far, and a large amount of useful technology has been published within the last ten years. Largely because of this available body of information, and demonstrated ability to use methane if fed with steam, the molten carbonate cell appears to be a prime candidate for development in a natural gas appliance. However, most of the prior work with carbonates has been with hydrogen and carbon monoxide fuels; comparatively few data have been obtained with methane plus steam. Therefore, a thorough study of the effects of variables is necessary. Further, anode materials probably can be improved in catalytic activity, since no real effort has ever been made to do this.

Despite its dominance of the high-temperature fuel cell field, the carbonate cell has inherent drawbacks. Molten carbonates are corrosive. They have low viscosities, thus are fugitive and will tend to creep away eventually over contacting surfaces. Further, sodium, lithium and potassium carbonates will decompose at operating temperatures, forming carbon dioxide, and alkali metal oxides which have low conductivity. To prevent decomposition, a partial pressure of carbon dioxide equal to or greater than the decomposition pressure must be present at all times at the anode and cathode, and other exposed surfaces of the electrolyte. In addition, enough carbon dioxide must be available at the cathode so that carbonate ions may be formed. The carbonate ion then migrates across the electrolyte to the anode, where it becomes available as a source of oxygen, to oxidize the fuel with a release of electrons to the external circuit. Thus, oxygen is not transported directly in this type of cell; carbon dioxide must be

(Excerpted for a paper presented at the A. G. A. Research and Utilization Conference, Cleveland, April 4-6.)

provided as an oxygen carrier.

In theory, a solid oxide cell should avoid the above difficulties. Solid electrolytes would be noncorrosive, easy to contain, and thermally stable. Oxygen would be transferred in the form of oxide ions, not carbonate ions, and no carbon dioxide additions to the oxidant are required. Although the theory of solid oxide fuel cells has been known for some time, no satisfactory experimental work has been done. Some attempts were made about 25 years ago, with carbon as the fuel and with oxide electrolytes that were far from the best choices according to modern solid state knowledge. Further, no effort was made to engineer solid oxide cells with practical shapes for high conductivities. In summary, the solid oxide cell is not nearly as advanced as the carbonate cell, but holds more promise if new theories lead to the choice of better electrolytes, and if engineering efforts to make practical cells are successful.

In the indirect approach to the utilization of methane, methane is first converted to a hydrogen-rich stream in external apparatus. Two processes are well-known: steam reforming and partial oxidation. Both produce impure hydrogen, containing concentrations of carbon monoxide and dioxide which will react with hydroxide electrolytes to form carbonates. In aqueous solution near ambient temperature, carbonates are poorly conductive. Further, carbonates can precipitate within electrode pores, covering up active reaction sites. This rules out the use of a number of fuel cells presently known which use aqueous KOH as electrolyte (Union Carbide, Allis-Chalmers, Electro-Optical, Leeson-Bacon). Of course, removal of carbon oxides is technically feasible but expensive, and the advantages of hydroxide cells would probably have to be very great to justify hydrogen purification costs.

It seems more reasonable to employ fuel cells that are not affected by the presence of carbon oxides, and these are the cells in which hydrogen ions carry the charge through the electrolyte. Certain acids may be used, in principle, as well as cation exchange resin membranes. The latter, in particular, have received much attention in recent years, first at General Electric and more recently at Ionics, Inc.

The original ion exchange fuel cell invention is credited to General Electric scientists, for hydrogen and oxygen as

fuel and oxidant. This led eventually to the development of a fully-engineered 200-watt portable generator for the Marine Corps, perhaps the most workable application of any kind of fuel cell. However, indications are that investment costs are much higher than for any other fuel cell; thus, the approach may not be economically attractive in a nonmilitary application. Further, there are technical drawbacks connected with control of membrane moisture content, destruction of the plastic electrolyte sheets due to local overheating, and with scale-up beyond a fairly small size.

The Ionics, Inc., fuel cell also employs ion exchange membranes, but uses bromine oxidant which can be regenerated with air in external apparatus. Advantages are gained in fuel cell current and power density, but a regeneration system is required, with attendant investment cost and maintenance.

In the case of acid fuel cells, little is known beyond recent work at the Kettering Foundation on pasty mixtures of orthophosphoric acid with powdered inerts. Higher current densities were observed than with cation exchange membranes. Also, the approach should avoid the above-mentioned drawbacks related to the use of resinous electrolytes. However, much work would be needed to establish the value of acid cells for power packs.

In evaluating the five demonstrable approaches to a home power pack, it might appear attractive to develop a miniature steam reformer and CO shift unit, and utilize the product gas in a battery of cation exchange cells. This would probably be inherently expensive, second only to a hydroxide fuel cell system requiring hydrogen purification. However, although investment costs of such a system would certainly be high, largely due to the catalysts employed in cation exchange cells, there may be very little research remaining to be done to develop this device. Steam reforming and partial oxidation processes have been commercialized, and cation exchange cells have been brought to a relatively advanced stage of development. Thus, this approach seems likely to be technically certain, but economically unattractive. Expenditure of more research effort may lead to only incremental improvements in costs.

More attractive as a research and development venture is the direct use of
(Continued on page 31)

Gas marvel of future told in ads

You'll see the day when natural Gas can run everything in your home!

Scientists around the world say that natural gas might well play a new and glamorous role for you in the space age. America's leading industrial firms have started turning out pilot models of fascinating new devices that turn gas directly into electricity.

Says *Reader's Digest* Magazine: "There has never been a period since the harnessing of electricity when so many laboratories have been exploring ways to produce power more cheaply and efficiently."

As your supplier of natural gas we are going to keep you informed of developments in these exciting new uses of gas. We will publish periodic reports such as this. Each will be simple, condensed, and verified by leading universities and research organizations.


Briefly, laboratories of 50 leading industrial firms and universities are developing new, easy ways to turn gas directly into electricity, right in your home, and without moving parts.

Think of it: sometime in the future, low cost gas, delivered underground, could run everything in your new home.


Of course, the familiar blue flame will continue to supply the heat for heating and cooking your home, cooking, water heating, refrigeration and clothes drying. Nothing is so fast or economical as the gas flame for these big jobs.

And for your lights and motors in the future, gas will be able to quietly make electricity in a small device, tucked away in a closet or put near the furnace.


THE FUTURE BELONGS TO GAS




THE FUEL CELL
This device converts the chemical energy of a gas directly into electricity. It is a simple, compact, and efficient power source. It can be used in a variety of applications, from small portable units to large stationary power plants.



THERMIONIC CONVERTER
This device converts the heat energy of a gas directly into electricity. It is a simple, compact, and efficient power source. It can be used in a variety of applications, from small portable units to large stationary power plants.



MAGNETOHYDRODYNAMIC CONVERTER
This device converts the heat energy of a gas directly into electricity. It is a simple, compact, and efficient power source. It can be used in a variety of applications, from small portable units to large stationary power plants.



GAS TURBINE ENGINE
This device converts the heat energy of a gas directly into electricity. It is a simple, compact, and efficient power source. It can be used in a variety of applications, from small portable units to large stationary power plants.

SOUTHERN CALIFORNIA GAS COMPANY - SOUTHERN COUNTIES GAS COMPANY

(Copyright by Southern California and Southern Counties Gas Companies)

The Future Belongs to Gas!

Full-page newspaper ads bearing this slogan, and given wide circulation in a current campaign by Southern California and Southern Counties Gas Companies, are selling that future today.

To judge from two of these ads, illustrated above, gas may indeed become the king of utility services—or at least will have "power a-plenty" in times not too many years ahead.

The ads shown break to the public news of the gas fuel cell and other devices promising low-cost direct generation of electricity from gas.

Through such devices, gas alone can supply all the power needs of an ordinary dwelling.

One of the ads is headlined "You'll see the day when the same Gas that

cooks your egg can light your bulbs." It goes on to list other new uses to be served by gas in the future—TV, dishwashers, electric motors, small appliances.

The ad continues:

"You may have read about amazing new devices for converting gas directly into electricity that are being developed by laboratories around the world. Some of these devices could fit into a closet in your home of the future."

Some units already are out of the lab and into the factory:

"A few manufacturing firms are starting up pilot production lines . . ."

All power supply will come through the mains, and will thus be immune to familiar power failures.

"Think of what the new develop-

ments can mean: Low cost natural gas, delivered underground, can be the only power coming into your house, and it will run everything."

In a full column, illustrated by drawings, the ad explains the development and workings of the fuel cell.

A second ad, headlined, "You'll see the day when natural Gas can run everything in your home," includes illustrations and explanations not only of the gas fuel cell, but also of the gas thermoelectric generator, the thermionic converter, and the MHD (magnetohydrodynamic) converter.

The fuel cell, as described in the ad, is "similar to a super-efficient storage battery that never needs recharging." It converts the chemical energy of gas directly into electricity.

Accident frequency rate down for 13th straight year

The number of disabling injuries experienced by the employees of our sample companies during the fourth quarter 1960, declined 12.5 per cent from the same quarter last year. These disabling injuries, however, were more severe in the current fourth quarter and resulted in more than two times the number of days lost during the fourth quarter last year. While there was a 15.8 per cent decline in the number of permanent partial disabling injuries and 13.5 per cent less temporary total disabling injuries during the quarter ending December 31, 1960, the average number of days charged per injury increased 25.7 per cent and 14.5 per cent respectively.

The accident experience of the sample group of companies, selected as being representative of the gas industry, based upon company size according to number of employees and geographical location, indicated that the gas utility and pipeline industry employees suffered 6.21

disabling injuries per million man-hours of exposure during the fourth quarter of 1960. This fourth quarter, 1960, frequency rate, consistent with the trend of the previous three quarters of the year, recorded the lowest frequency of disabling accidents, when compared with the corresponding quarter of each year, since the inception of the present sample in 1958. The severity rate during the current fourth quarter equalled its peak of 946 days lost per million man-hours of exposure established during the third quarter of 1959.

Based upon the cumulative quarterly accident data of our sample group of companies the gas utility and pipeline industry will achieve, for the thirteenth straight year, another reduction in the accident frequency rate and the 7th consecutive record low frequency rate. The frequency of accidents within our sample dropped 12.8 per cent from the 7.16 in 1959 to 6.24 disabling injuries per million man-hours of exposure during 1960.

These disabling injuries resulted in a loss of 559 days per million man-hours worked (severity rate), an increase of 33 days per million man-hours of exposure above the 526 days lost by the employees of the sample group of companies during 1959. This increase was primarily due to the very sharp increase in the number of days charged to permanent partial disabling injuries. During the current year, the sample showed only one additional injury of this type over the previous year with more than 5,000 additional day charges.

Sample companies submitting supplementary vehicle statistics showed a very slight decrease in the rate of accidents per 100,000 miles travelled during 1960. Vehicles of the sample companies travelled 230,413 miles and were involved in 3,186 reportable accidents registering a rate of 1.38 reportable accidents per 100,000 miles traversed during 1960.

GAS EMPLOYEE ACCIDENT EXPERIENCE

Twelve Months 1960

	Annual 1959	First Quarter (Sample) 1960 1959		Second Quarter (Sample) 1960 1959		Third Quarter (Sample) 1960 1959		Fourth Quarter (Sample) 1960 1959		Twelve Months (Sample) 1960 1959	
Number of reporting companies	508	83	83	83	83	83	83	83	83	83	83
Average number of active employees	192,942	75,931	75,075	77,065	76,589	77,542	77,558	76,508	75,911	76,762*	76,283*
Number of Injuries											
Fatality	17	1	2	2	1	2	5	4	1	9	9
Permanent total disability	1	0	0	0	0	0	0	0	0	0	0
Permanent partial disability	107	5	2	4	4	5	4	16	19	30	29
Temporary total disability	2,744	220	265	236	266	251	286	218	252	925	1,069
Total	2,869	226	269	242	271	258	295	238	272	964	1,107
Days charged											
Fatality	102,000	6,000	12,000	12,000	6,000	12,000	30,000	24,000	6,000	54,000	54,000
Permanent total disability	6,000	0	0	0	0	0	0	0	0	0	0
Permanent partial disability	49,280	765	274	3,675	544	2,237	1,028	7,969	7,528	14,646	9,374
Temporary total disability	49,045	4,019	4,254	4,443	4,194	4,987	5,245	4,320	4,368	17,769	18,061
Total	206,325	10,784	16,528	20,118	10,738	19,224	36,273	36,289	17,896	86,415	81,435
Frequency rate	7.31	5.93	7.19	6.19	7.00	6.62	7.69	6.21	6.77	6.24	7.16
Severity rate	526	283	441	515	277	493	946	946	445	559	526
Vehicle accident statistics											
Average number of employees	150,952	68,951	68,870	69,623	69,844	69,968	70,771	69,168	68,840	69,428*	69,381*
Number of vehicles	46,646	19,148	18,573	19,098	19,449	19,393	19,120	19,412	18,925	19,263*	19,017*
Vehicle miles traveled (000)	545,494	54,620	50,658	57,951	57,615	57,173	57,289	60,669	58,688	230,413	224,230
Number of reportable accidents	7,105	913	905	702	709	656	684	915	830	3,186	3,128
Number of personal injuries	322	47	27	28	24	23	16	44	36	142	103
Accidents per 100,000 miles traveled	1.30	1.67	1.79	1.21	1.23	1.15	1.19	1.51	1.41	1.38	1.39

* Average of four quarters.



Left: A. G. A. consultant, Prof. E. C. Weaver, conducts experiments on TV
Below: The demonstration as seen by teachers, with A. G. A. slug on screen



TV for teachers tells gas story

A closed-circuit television network brought the American Gas Association and the gas industry forcefully but discreetly to the attention of the science teachers from all over the country attending the annual convention of the National Science Teachers' Association in Chicago, March 25-28.

The television system was provided for the N.S.T.A. Convention by A. G. A.'s Educational Service Bureau. The Bureau works closely with N.S.T.A. on A. G. A.'s science materials for schools, which are evaluated and approved by N.S.T.A.'s Committee on Business-Sponsored Teaching Aids.

On the theory that to be of interest to the attending teachers the television coverage had to be non-commercial, A. G. A. left the programming entirely in the hands of the N.S.T.A. people. In the planning stage and during the convention, A. G. A. staff members gave guidance, advice, and technical assistance, but

otherwise did not interfere in the programming, except to lay down a rule that nothing competitive to gas could be shown or discussed.

The television system originated in a section of the exhibit area just outside the doors to the main meeting room in the Sherman Hotel. This roped-off area, with its television cameras, lights, technicians, control panels, and all the stage activity that goes with live TV, attracted maximum attention from conventioners.

Fifteen monitor sets were set up around the exhibit area. The network programming was also carried to each of the Sherman's 1501 rooms.

Program material consisted of interviews, panel discussions, science demonstrations, newscasts, messages, notices of coming meetings, and films. A. G. A. received its recognition through credit lines reading "American Gas Association" printed at the bottom of each card

that bore a message or a meeting notice, through announcements every hour that the television network was a service provided by the American Gas Association, and through identification of Professor Elbert C. Weaver, who performed science demonstrations and conducted interviews, as one of the consultants who prepare A. G. A.'s teaching materials on gas.

Professor Weaver's two-hour long science demonstrations, one on Sunday and one on Monday, gathered large crowds around the television area to watch him perform "live" in addition to those who watched him on their screens. Professor Weaver, who teaches at Phillips Academy in Andover, Mass., is author of the A. G. A. "Science Principles and Your Automatic Gas Appliances" series and the two books "Experiments with Gas" and "Advanced Experiments with Gas." In addition to his demonstrations, he also interviewed Roy Gib-



Paul Inskip, A. G. A.'s Midwest manager (r) shows industry teaching aids to R. Rice (l), and O. Keesler of NSTA



Bruce McCandless, chairman, A. G. A. Educational Service Subcommittee, chats with Dr. John W. Renner, of NSTA staff

bons, science editor of the Chicago *Tribune*, over the television network on Tuesday morning.

The television network ran from 7 a.m. to 7 p.m. the first three days of the convention, and from 7 a.m. to noon on

the last day, the hour when the convention officially closed.

Meanwhile, an A. G. A. exhibit of teaching aids received heavy traffic.

All of the gas industry teaching aids published by the Educational Service

Bureau were displayed, from the first kit, "Natural Gas—Science Behind Your Burner" through the "Science Principles and Your Automatic Gas Appliances" series. Folders listing and describing all the kits were given out to the teachers who stopped at the booth, as were student sheets from the kits each teacher was most interested in. Teachers then filled out registration cards to have the kits that they wanted sent directly to their schools to be used in classwork.

These teaching materials are supplied free to schools, with the gas company in each area bearing the cost under an agreement that each company has with A. G. A.'s Educational Service Bureau.

The Educational Service Subcommittee, the group guiding the activities of the Educational Service Bureau, met in Chicago during the N.S.T.A. Convention. Committee members, under the chairmanship of Bruce A. McCandless, Milwaukee Gas Light Company vice president, toured the N.S.T.A. exhibits and took notes comparing the teaching materials offered by other industries to those offered by A. G. A.

Reactions to the television network were enthusiastic, both from N.S.T.A. officials and the science teachers. The president of N.S.T.A., Dr. Robert A. Rice, in an address before the convention's annual banquet on the night of March 27, publicly thanked the American Gas Association for providing the closed-circuit system, and said it had proved a valuable service and an addition to the convention. The teachers showed agreement by applauding. A. G. A. was the only business group singled out for such mention during the convention.

Industrial relations

(Continued from page 10)

ing records, consulting, and testing. But when it comes time to make the decision, they forget everything but the test. That is because the test's result is tangible; it may even be written as a number. The manager overlooks the fact that the test score is only an indicator. It is not intended to be taken as absolute fact. And so a two-point difference in the scores is made reason enough for picking one candidate over another.

If a manager ignores a man's record with the company on the basis of a two-point test differential, he is not only doing the individual an injustice, but is also shortchanging the

company of one of its most vital assets, skilled personnel. It is by using the records, supplemented with test results, that managers have the best opportunity of locating the person for whom they are looking.

Skilled people are at a premium. A company that has enough talent to fill all its positions with quality is a rarity. With this situation it just does not make sense for an executive to staff his department in a haphazard fashion. To do so is simply to waste talent, and to undermine the efficiency of the business. Sound organization, and good management techniques are a great help. But the common denominator of a rising enterprise is efficient, skilled people. And these people can help the most when they are in the right job.

HELP WANTED

Assistance of A. G. A. member companies is being sought by the U.S. Department of Agriculture in a current survey the department is making of privately-owned outdoor recreational facilities open to the public.

If your company maintains such facilities or areas, please write to RECREATION, c/o A. G. A. MONTHLY, 420 Lexington Ave., New York 17, New York.

The Department of Agriculture would like a brief general description of the facility.



Top: Home economics teachers learn about marvels of gas
Bottom: After demonstration, a close-up of the appliances



'Inforama' teaches teachers

Home Economics teachers from Detroit schools became students for a day recently when they attended a "Blue Flame Inforama" presented by Michigan Consolidated Gas Company.

Almost 200 teachers listened to talks on the new wonders of natural gas and saw a display of modern gas appliances, grouped around a 40-year-old high oven range. New equipment, such as Roper's Charm Range and Whirlpool's No Frost Refrigerator, created a distinct contrast with the old stove.

Mrs. Ellen Bridges, A. G. A. Home Service Counselor, told the teachers about her experiences at the International Food Fair in London, England. She illustrated her talk with pictures, pointing up the difference between the rather old-fashioned English kitchen facilities and modern American gas appliances.

E. Carl Sorby, vice president, Geo. D. Roper Corporation, spoke on "Adventures in New Living." He stressed the use of gas and gas appliances as

modern equipment. The progress his company has made in the development of ranges over the years gave the teachers a better idea of necessary work behind the scenes. Mr. Sorby demonstrated on Roper's Charm range. He prepared a turkey on the rotisserie, crown roast of lamb in the oven and gourmet carrots on the "temp-trol" burner.

After a dinner served by miniature gas light, Wilbert H. Glines, Detroit district sales manager for Michigan Consolidated, outlined new developments in the gas industry. He covered progress of the industry over the years and made comparisons between gas usage yesterday and today. Mr. Glines described some of the new appliances introduced in 1960.

The teachers learned from him about gas ranges designed to be hung on kitchen walls, mounted on cabinets or used as built-ins. The instructors of the future homemakers of America also were given descriptions of no-frost refrigerators, low temperature ovens and new

instantaneous through-the-wall gas heaters. They learned about current gas research and developments in the fields of gas turbines, transistorized battery-ignited gas ranges without pilots, and self-energized ignition systems for room heaters.

At the close of the evening's program, every teacher took home one of Mr. Sorby's cards naming her a "Roper Knightress of the Saucepan," a gas flame terry-cloth kitchen towel and a sterling spoon lapel pin.

Some of the teachers' comments:

"Thanks for another fine dinner meeting. I'm sure all the Home Economics teachers who attended know that you, your splendid staff, and your company are 'with us.'"

"We didn't realize gas could do so many wonderful things. These gas developments open a whole new world of cooking ease."

A. G. A. makes available Census statistics on fuels, appliances

The 1960 Census included detailed questions on population and housing characteristics asked of over 2.5 million households (the so-called 5% sample).

Some of the sample questions referred to appliance equipment and fuels used in America's homes, information that is of interest to every gas company and gas appliance manufacturer.

To make these statistics even more useful and valuable, the American Gas Association and its Marketing Research Committee, in cooperation with eight other associations in the appliance, automotive, fuel and utility fields, formed the Association Council on Housing and Population Census. The Association Council has sponsored a special series of county-by-county cross tabulations that will not be published by the Census Bu-

reau or any other source. These special tabulations will include:

(a) Type of heating equipment (wet or dry heat, central or non-central methods) by type of fuel used.

(b) Fuel used for water heating and fuel used for cooking compared to fuel used for heating.

(c) Fuels used for heating, water heating and cooking according to family income level.

(d) Fuels used for heating, water heating and cooking classified by age of home; also method of house heating according to age of home.

These and many more significant analyses will be available to gas companies at a moderate cost.

The Council has received permission from the U. S. Department of Commerce to undertake the project. The Data Processing Center, a Division of the S. J. Tesauro & Co., Detroit, Michigan, has been retained as the agency that will develop the cross tabulations from Census Bureau tapes and will distribute the correlated tabulations.

Release of the information by states, counties and "standard metropolitan statistical areas" is scheduled to start this spring and will be completed by the end of the year.

Complete details of the project and its publication, together with a sample form of the tables and order forms, can be obtained from the Bureau of Statistics, American Gas Association, 420 Lexington Ave., New York 17, N. Y.

Meet your Association staff



Phyllis Kilkenny

Phyllis Kilkenny, Home Feature Editor in the A. G. A. Public Information Bureau, describes herself as being on "a kind of perpetual busman's holiday."

"After writing all day about gas appliances, I go home at night and put this knowledge to good use. I really enjoy cooking and laundering and am always interested in new ways of doing things," Phyllis says.

She also likes to talk to other women about their household problems because it gives her ideas for feature stories. "If you know the homemaker's likes and dislikes, you're in a better position to tell her how gas appliances can meet her demands. She'll pay attention if you talk her language."

Apparently this pays off, judging by the flood of newspaper clippings that result from her efforts. Phyllis' varied editorial duties include the preparation of news releases, special press kits in support of national promotion and advertising campaigns, feature articles for women's magazines and entire newspaper sections devoted to gas appliances.

Before joining A. G. A. six years ago, Phyllis was equally enthusiastic about aviation. She edited a weekly newspaper for employees of Pan American World Airways for three years and then joined the public relations department of American Airlines as special feature writer.

When her husband was transferred to New England, Phyllis gave up aviation. "We bought a big house in the country and started a family." Soon after, however, Phyllis became editor of a weekly newspaper with approximately 8,000 circulation. "It worked out well because I could work at home. I'd type my stories with the baby alongside me in his play pen. My children have grown up to the sound of a typewriter and all of them can type fairly well—although the oldest is only thirteen and the youngest five-and-a-half."

Now residing in Cold Spring Harbor, Long Island, a suburb of New York, Phyllis, her husband Ted, and their children enjoy country living. "We skate in winter, swim in summer and shovel snow most of the time."

Phyllis was born in Anaconda, Montana. Her father is a mining engineer and the family traveled a great deal, finally settling in New York. She studied journalism at Columbia University and goes back to college, from time to time, for special courses.

"I really don't have time for hobbies, but I guess you could say that my first interest is my family, then my job, then reading and studying. I feel awfully lucky to be working with such congenial people and believe it or not, the gas industry is even more exciting than aviation."

Seminar joins scientists, pipeliners



Major speakers at the gas industry's first Line Pipe Research Seminar, held last month in Dallas, included (left to right): J. L. Thompson, George McClure, L. T. Potter, B. D. Goodrich, and R. S. Ryan

Hailing pipeline research as "the most fruitful point of contact" between the transmission branch and the gas industry at large, Lester T. Potter, president of A. G. A., set the theme for the industry's first line pipe seminar March 23-24 in Dallas.

Mr. Potter was featured luncheon speaker during the two-day meeting sponsored by A. G. A.'s Line Pipe Research Committee. The seminar brought together more than 125 administrative and technical representatives from major gas transmission companies, as well as a battery of research scientists from Battelle Memorial Institute.

Reports concentrated on results of an eight-year-old research program aimed at learning more about the performance characteristics of steel pipe and the development of safe and practical pipeline designs. Highlights were outlined by the Battelle representatives who carried out the research under A. G. A. sponsorship.

Dr. George T. Hahn, consultant in Battelle's Metal Science Group, observed that the problem of cleavage fracture in steel is peculiar neither to one industry nor one particular type of steel. Cleavage fracture problems, which have plagued engineers since about 1850, reached major proportions in welded ship design during World War II. The fractures themselves are characterized by a chevron pattern in the cross-section of the break and by a distinctive crystalline appearance in the metal.

Noting that these fractures first occurred in modern pipelines about eight years ago, Dr. Hahn said much of A. G. A.'s subsequent pipeline research effort has been directed toward determining the origin and propagation of cleavage fractures in line pipe.

George M. McClure, director of Battelle's Solid Mechanics Research Group, outlined recent experimental work which has proved valuable in designing against cleavage failure. He also reported new

evidence of a correlation between some of the research program's laboratory tests and full-scale behavior of pipe in actual service.

In a later presentation, Mr. McClure reported that improved design, construction and test procedures have resulted from secondary stress investigations conducted by nearly a dozen major pipeline companies on their own lines. Results were summarized in "Measurement of Secondary Stresses in Pipelines," a 79-page technical report published by A. G. A. in late 1959.

The development and use of a new machine for testing cyclic loading characteristics of full-size branch connection specimens were described by T. J. Atterbury, project leader of the Solid Mechanics Research Group. He also reviewed A. G. A.-supported studies on the design of branch connection reinforcements, emphasizing that this work has been instrumental both in pinpoint-

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Facts and Figures

Prepared by A. G. A. Bureau of Statistics

Total sales of gas to ultimate consumers during February 1961 aggregated 10,014 million therms, an increase of 5.5 per cent over the 9,491 million therms in the comparable month of last year. February 1961 sales to industrial users amounted to 3,323 million therms, up 2.4 per cent over February 1960. Most encouraging is the fact that residential and commercial gas customers used 7.4 per cent more gas in February 1961 than in the same month of 1960—7,039 million therms versus 6,551 million therms respectively. This gain can be attributed to the cold weather experienced during the month, sales of gas to new customers, especially house heating, that have been added to gas utility lines through new home construction, and an upward surge in industrial production.

For the twelve-month period ending February 28, 1961, utility gas sales to ultimate consumers totalled 90,342 million therms, an increase of 5.5 per cent. Residential, commercial and "other," represented just over half of the total and experienced a gain of 10.8 per cent as compared to the preceding year.

New housing starts continued to decline in February as in January of this year. February 1961 non-farm housing starts of 74,200 are 16.5 per cent lower than the same month last year, although the decline is not as severe as in previous months. Because private construction expenditures in non-residential construction have remained vigorous, the total dollar value of new private construction has declined only 0.8 per cent from the same month last year.

The effect of lagging new home construction activity is evident in the data on manufacturer shipments of residential appliances. Shipments of gas water heater equipment in February 1961 show a 3.8 per cent decline from 1960. The Gas Appliance Manufacturers Association reports 124,800 built-in and

(Continued on page 26)

SALES OF GAS AND ELECTRIC RESIDENTIAL APPLIANCES DURING FEBRUARY, 1961

(WITH PER CENT CHANGES FROM THE CORRESPONDING PERIOD OF THE PRIOR YEAR)

	February		January		2 Months, 1961	
	Units	Per Cent Change	Units	Per Cent Change	Units	Per Cent Change
RANGES (including built-ins)						
Gas	124,800	-21.8	115,200	-13.7	240,000	-18.1
Electric	128,100	-10.5	109,400	-4.9	237,500	-8.0
WATER HEATERS						
Gas	206,700	+3.8	227,000	+5.3	433,700	+0.8
Electric	60,300	-0.3	52,500	+7.8	112,800	+3.3
GAS HEATING—Total	73,814	-2.4	74,787	+1.6	148,601	-0.5
Furnaces	60,100	+1.5	59,600	-0.2	119,700	+0.7
Boilers	8,255	+0.7	8,787	+28.8	15,076	+13.4
Conversion Burners	5,400	-34.1	6,400	-9.9	11,800	-22.9
OIL-FIRED BURNER INSTALLATIONS	31,735	-8.2	41,309	-10.4	73,044	-9.3
DRYERS						
Gas	28,471	-26.0	36,968	-1.0	65,439	-14.0
Electric	52,869	-24.0	66,190	-11.0	119,059	-18.0

Sources: Gas Appliance Manufacturers Association, National Electrical Manufacturers Association, "Fueloil and Oil Heat," and American Home Laundry Manufacturers' Association.

GAS SALES TO ULTIMATE CONSUMERS BY UTILITIES AND PIPELINES DURING FEBRUARY, 1961

(MILLIONS OF THERMS)

	Month of February			Twelve Months Ending February 28		
	1961	1960	Per Cent Change	1961	1960	Per Cent Change
Natural Gas	10,014.3	9,491.9	+5.5	90,342.6	85,639.7	+5.5
Manufactured and Mixed Gas	347.5	304.6	+14.1	2,364.3	2,282.8	+3.6
Total Gas	10,361.8	9,796.5	+5.8	92,706.9	87,922.5	+5.4
Residential, commercial, and other	7,038.7	6,551.0	+7.4	47,030.5	42,454.6	+10.8
Industrial	3,323.1	3,245.5	+2.4	45,676.4	45,467.9	+0.5
Indices (1947-1949 = 100)						
Total gas sales (A. G. A.)	296.4	280.2	+5.8			
Residential, commercial, and other (A. G. A.)	320.8	298.6	+7.4			
Industrial (A. G. A.)	255.1	249.2	+2.4			

PERTINENT BUSINESS INDICATORS, FEBRUARY

(WITH PER CENT CHANGES FROM THE CORRESPONDING PERIOD OF THE PRIOR YEAR)

	February			January		
	1961	1960	Per Cent Change	1961	1960	Per Cent Change
Industrial activity, FRB (1947-49 = 100)	155.0	166.0	-6.6	155	168	-7.7
Consumer prices (1947-49 = 100)	127.5	125.6	+1.5	127.4	125.4	+1.6
Housing starts, non-farm (thousands)	74.2	88.8	-16.5	69.1	84.3	-18.0
New private construction expenditures (\$ million)	2,577	2,596	-0.8	2,722	2,870	-5.2



Early Texas Kitchen on view at the Dallas Trade Mart's Gas Appliance Center shows pioneer influences



Texas kitchen is gas showcase

An antique Texas kitchen is one of the sights which many visitors to the A. G. A. Convention in Dallas next October will wish to include in their itineraries.

The 300-odd years that Texas spent under the Spanish flag apparently had little influence on the architecture and home furnishings of the Lone Star state pioneer settlers.

"Contrary to popular opinion, Texas homes of a century ago did not primarily reflect the Spanish influence," declared Wiley Fuqua, a representative of the Texas Chapter of the American Institute of Decorators, and a descendant of a pioneer Texas family.

"Homes of that era—in both architecture and in furnishings—strongly demonstrated the ancestry of the people who settled major portions of Texas—the French, German and English immigrants and their descendants."

Demonstrating his point, Mr. Fuqua created for the Dallas Trade Mart a warm and friendly "Early Texas Kitchen" which hasn't even a spark of Spanish.

The kitchen, in the Trade Mart's Gas Appliance Center, is a happy combination of early Texas antiques, grayed pine paneling and shiny new gas appliances.

Designed to display the newest gas appliances in a "new" setting, the room in fact proves that antique lovers can carry their theme right into the kitchen.

Weathered pine walls and cabinets, and dark cork vinyl flooring form the background for the handsome furniture of the nineteenth century and gas appliances of the twentieth century.

Newel posts—some genuinely old, others copies—are found throughout the kitchen. They flank the big bay window and form the supports for a shelf-canopy over the barbeque stove and another canopy over the laundry center.

An antique flour barrel with a tole-like painted decoration forms the vent over the modern gas-fired barbeque grill (O'Keefe and Merritt's Ranchero unit).

Crackled porcelain hardware blends with a modern-patterned counter top (Texolite) which also gives the appearance of crazed tile.

Electric light fixtures, beside the sink, over the fireplace and a center-of-the-room chandelier, are copies of old gas-light fixtures, complete with the old-time on-off valve.

Modern gas logs (Peerless) glow in a fireplace mantel taken from an early Dallas home.

The drapery colors of soft charcoals, browns and pale green set the color theme for the room.

A frostless gas refrigerator (by RCA Whirlpool); a "micro-ray" oven which cooks in half the usual time (by Hardwick) and a "charm" range—with low-level burners and eye-level oven (by Roper)—dominate the food preparation area.

A modern disposer and dishwasher (by Waste King-Universal) and a stainless steel sink (by Elkay) fit serenely into the old surroundings.

German majolica plates and cut crystal drinkware are on the table around a centerpiece featuring candlesticks which are converted oldtime Texas branding irons.

'Money men' meet at St. Louis



A program focusing on problems of accountants and financial men brought nearly 950 electric and gas utility accountants to the Chase-Park Plaza Hotels in St. Louis, April 17-19, for the annual conference jointly sponsored by A. G. A. and the Edison Electric Institute.

Three major areas were explored: General Activities, Customer Activities and Special Activities. Within each category, detailed discussions were held, panel sessions explored topics in depth, informative papers were presented, and committee reports were made to the conference.

Opening the first general session on Monday morning with inspirational talks

and greetings to the conference, Edwin Vennard, vice president and managing director, Edison Electric Institute, and Edward H. Smoker, president, The United Gas Improvement Company, stressed the role which gas and electricity are playing in the American economy. Utility progress over past decades and opportunities which lie ahead were outlined by both speakers.

Marvin Chandler, president, Northern Illinois Gas Company, wove an intricate pattern of the relationship of profits to performance. In a 20-point analysis he pointed out the dependence of one on the other.

Citing examples from his own company's experience, Mr. Chandler discussed the improved procedures, methods and technology which can be initiated—when profits are sufficient to allow innovation. Reversing this thought, he revealed the importance of performance which produces profits that allow a company to take the strides forward. In turn, the profits allow for greater performance, he declared.

In a related talk Monday morning, Tennyson Guyer, director of public relations, Cooper Tire and Rubber Company, spoke on "People, Profit and Persuasion." In a discussion sparkling with

Wide variety of financial problems

analyzed at annual A. G. A.-EEI National Conference

of Electric and Gas Utility Accountants



On hand to open the General Session were: (standing) William T. Hamilton, and Reinhold H. Johnson, (sitting) J. Wesley McAfee, and George R. Hays

humor he called on the conference to eliminate the idea that publicizing profits is a bad information policy.

Commenting on profits, he stressed the importance of developing a feeling of loyalty and responsibility among company personnel. A major key to profits lies within the company. This can be utilized by encouraging personnel to submit new ideas and by giving proper credit when such ideas are used.

On Monday afternoon seven separate sessions were held in the two hotels.

Depreciation Accounting was presided over by J. B. Madigan, The Hartford Electric Light Company and W. H.

Caunt, Jr., Public Service Electric and Gas Company. Papers were given on unit summation procedures for computing depreciation expense, computer applications in the field of depreciation, mortality studies of boilers and depreciation of land and land rights. At the close of the session a four-member panel discussed "new thoughts in depreciation."

A General Accounting meeting delved into responsibility accounting and reports, electronic accounting machine applications, training and development of utility accountants, and how accountants can improve performance and increase performance and profits.

Plant accounting and property records including construction cost control and reporting, property accounting problems in nuclear power stations and an approach to the application of EDP equipment to plant accounting records were presented in another of the Monday afternoon sessions.

In related meetings, groups explored customer collections and customer relations. The first session involved collectors vs. "cut off" men, equal payment plans, the credit picture, and computer aids to credit and collection. Following each paper, the speakers answered questions from the floor.

The second session discussed what's new in customer relations, communications media in customer relations, automation vs. humanics, and merits of EDP systems in customer relations.

In addition, a "town hall meeting" and an audit information panel were held Monday afternoon.

Many of the sessions continued on Tuesday morning. These explored in greater detail the fields of customer collections, customer relations, depreciation accounting, and plant accounting. In addition a special forum was held on accounting employee relations. Sources of

ing by management in general. The management control stage in which auditing has only recently evolved, he pointed out, has extended the scope of auditing research, re-examination of objectives, revaluation of audit programs and practices, a considerable quantity of sales effort, and proven value to management.

"Internal auditing must not rest on the laurels of past achievements, but accept the challenge of the future by constantly increasing its service and assistance to top management," he declared. "This demands a vigilance for new

concentrated on the fields of general activities, customer accounting, customer collections, customer relations, and added accounting employee relations on the final morning of the three-day meeting.

New accounting developments, presented by W. B. Thatcher, Arthur Anderson Company, reviewed new developments in matters reported the previous year and items which developed in the past year.

"Keeping up with new accounting developments and their effect on the accounting of the electric and gas industry is a very important function of a utility



Tennyson Geyer
President, Profit and Loss

Accountants assemble for "Town Hall Meeting" Monday afternoon

dissatisfaction in the office, to rate or not to rate, and the supervisor as a listener, provided stimulus for the discussion period following presentation of papers.

After a luncheon highlighted with progress reports by chairmen of long-range projects and showing of a natural gas production film in color, "Offshore Venture," the conference added a session on internal auditing to the Tuesday afternoon program.

Commenting on changing trends in internal auditing, G. W. Waddill, United Gas Improvement Company, noted that industrial and business growth since World War II has witnessed the recognition and utilization of internal audit-

ideas, research and creativeness in the development of audit formats and the audit program agenda," he said.

Critical analysis of "Why Customers Appeal to Higher Authorities," presented by R. L. Klaess, The Brooklyn Union Gas Co., provided insight into the reasons why consumers resort to outside government agencies for satisfaction. "Giving the attention that will command respect, are in essence the seven key words to the successful promotion of good customer relations by all concerned in the gas and electric industry today," he stated.

Continuing the fruitful sessions of the previous two days, the conference

accountant," he said.

This means continually reviewing releases published by the FPC, SEC, and state regulatory authorities and being cognizant of proposed changes in tax laws as well as changes actually written into the law according to Mr. Thatcher.

Also at the General Accounting session, R. E. Harbaugh, Philadelphia Electric Company, gave a review of how his company established a new systems and data processing department within the finance and accounting department, to serve as a company-wide service center for all data processing activities.

Outlining the organization of electronic data processing for maximum ef-

fectiveness, he drew three conclusions from his discussion:

1. With the advance of the art of electronics to its present stage, organization planning is just as important, if not more so, than equipment selection in planning the EDP function for maximum effectiveness;
2. The integrated company approach appears to have the greatest potential for economic benefits; and
3. When occasions arise in companies where it appears that a new or different type of talent is required—such as programming—the chances are that we have

and at what intervals to bill.

The latter topic presented by T. A. Kostanski, Toledo Edison Company, compared results of a questionnaire circulated in the last year to results of a similar survey taken five years ago. In a summary of the findings regarding billings methods and equipment, he reported that a horizontal trend was discernible. Out of 56 companies that supplied answers to the questionnaire, then and now, there were no changes in their billing or reading method.

After discussing various methods which have been proposed for balancing payments, or spreading meter readings over a quarterly period, he pointed out that such plans would have been impossible for many companies a few years ago because of the problems involved in arriving at a customer's average monthly usage on an annual basis. Citing the electronic computers that are now in the economic reach of the medium-size companies and the vast information

storage capacities that facilitate this type of computation, he declared that these innovations have made such operations practicable.

The remainder of the Wednesday morning session was taken up by panel discussions on customer collections and a general session with response from the floor on customer relations.

Returning to the subject of the effects of automation on humans, an enlightening panel discussion was held in the Accounting Employee Relations session. The general effects on employees and their work was presented by a panel consisting of D. J. Pizzimenti, Detroit Edison Co., F. J. McNulty, Boston Edison Co., H. M. Currey, Niagara Mohawk Power Corp., and K. V. Arnold, Columbus and Southern Ohio Electric Co.

During the three-day conference, eight major manufacturers presented a display of the latest electronic data processing equipment in a special exhibit at the Chase Hotel.

Chandler speaks on
"Finance and Profits"



the people to fill these jobs within our own organizations if we will just take the time and effort to select and train them. The time and effort will more than pay for itself in good employee relations.

In a meeting on customer accounting, with A. A. Del Buono, Boston Edison Company, and H. F. Luther, North Shore Gas Company, presiding, speakers presented papers on postal regulations and their application to utilities in post card postal regulations, customer accounting functions before and after conversion to a mechanical system, intra-company data transmission and transportation, automatic meter reading, when to read,

Pipeline seminar

(Continued from page 19)

ing deficiencies in reinforcements and suggesting improved designs.

The effects of chemical composition, grain size, finishing temperatures and cold work on the properties of line pipe were discussed in a metallurgical review presented by F. W. Boulger, chief of Battelle's Metal Working Group.

In another report, P. J. Rieppel, chief of the metals joining research division, forecast that the ultrasonic testing equipment now being set up in many pipe manufacturing mills "soon will become universal for the inspection of every inch of welds in line pipe prior to delivery." His presentation also covered A. G. A.'s girth welding studies and a report on automatic processes for the girth welding of pipe in the field.

New data on the evaluation and behavior of line pipe defects were outlined by Robert Eiber, research engineer in the Solid Mechanics Research Group. Touching on the effects of such factors as longitudinal stress, temperature and changing pressures which can reduce pipe strength, he pointed out that pipe material has sufficient ductility to accept many kinds of defects without the occurrence of leaks.

Mr. Eiber also described the types of defects which should be removed from pipe during construction of transmission

lines. He noted, however, that recent research shows some types of dents in line pipe are not nearly as serious as previously suspected.

Baxter D. Goodrich, chairman of A. G. A.'s Line Pipe Research Committee and senior vice president of Texas Eastern Transmission Corp., told seminar participants that, as a result of the eight-year-old research program, transmission companies which formerly kept their pipe problems to themselves now discuss them and exchange information with other companies in cooperative efforts to develop solutions.

He said some \$200,000 will be spent during 1961 for A. G. A.-supported line pipe research, to which individual company research outlays should be added. The 1961 program will include preparation of proposed changes in the B31.8 piping code, which would strengthen some requirements and relax others. Mr. Goodrich also said that a full-scale facility for field testing large-diameter pipe will be built this year under the line pipe research program.

A. G. A. representatives presiding at the four seminar sessions in the Sheraton-Dallas Hotel included Mr. Goodrich; J. L. Thompson, general superintendent, Michigan-Wisconsin Pipe Line Co.; J. T. Innis, vice president, Northern Natural Gas Co.; and R. S. Ryan, supervisory engineer, The Columbia Gas System Service Corp.

Research

(Continued from page 9)

guished the main burner.

Extensive investigations into other range top pilot systems were reported, which are helping to eliminate or minimize flame outage and other ignition problems.

In another field, J. C. Griffiths, A. G. A. Laboratories, presented a new approach to home appliances in his discussion of a compact water heater, built-in oven combination appliance. By separating the storage vessel from the heat exchanger, the bulk of the appliance could be stored in the attic, in a closet, in wall spaces or above or below built-in appliances, according to Mr. Griffiths.

Major advantage of the non-integral water heater is to free floor space in a home. In addition to this space saving feature, such a heater equipped with new type burners also possesses the advantage of being able to produce fairly large quantities of hot water in relatively short periods of time.

To call attention to the trend of developments in competitive fields, E. T. Selig, Burnham Corporation, gave an illuminating presentation of advancements in the electric and oil industries. Centering his discussion on home heating methods, he spoke on the heat pump, induced draft oil firing, oil burners, electrical resistance heating and others. Water heating gains by competitors were also detailed in a comprehensive account of what the competition is doing.

He called for greater emphasis on gas heating appliances that incorporate the following features available with electric and oil heating:

- Elimination of chimney cost
- Higher combustion efficiency
- Lower standby loss
- Adaptability to add-on rooms and where space may be heated infrequently
- Combination equipment for year-round air conditioning

Development of equipment with these features would, he felt, increase the competitive position of gas in the heating picture.

Elizabeth Sweeney Herbert, *McCall's Magazine*, gave the 450 representatives a woman's viewpoint on gas appliances. Chiding the gas industry for not having more home economists on the staffs to educate housewives and to help guide development of appliances used by women, she called for steadier pilot lights, elimination of sharp metal edges and exposed screw heads, and other design and performance items, which would substantially improve the acceptance of gas equipment.

Many of the items called for by Mrs. Herbert were included in the new approval requirements given by P. J. Gratiaa, Laclede Gas Company.

Centering his talk on "What's New in Requirements—1961," he cited selective gas approval as one of the major changes taking place. This allows a manufacturer to select one or more gases for which he desires approval, in contrast to the previous method of passing tests for natural, manufactured and mixed gases.

Mobile homes

Another totally new category that has required consideration within the last few years is specific approval of appliances for mobile homes. Requirements are now available for a number of such appliances.

Changes also have been made in requirements or test procedures for domestic ranges, water heaters, central furnaces, clothes dryers and air conditioners.

Future requirements are expected to include incinerators having capacity larger than the current limit of five cubic feet, illuminating devices such as gas lights, gas-operated signs and decorative torches, commercial cooking equipment not previously covered, and commercial laundry equipment.

"Ideas which exist only in the mind,

in laboratory notes or in papers read at technical societies will not alone inspire management to move out into new frontiers," stated R. L. Evans, Whirlpool Corporation.

Too often scientists and technical people fail to recognize the urgency and need of effective communications. The tendency to say that conclusions are self-evident from the facts is common. "Logical as this philosophy sounds, it just doesn't work that way," Mr. Evans declared.

Technical men have two areas of responsibility beyond developing competence in their field. These include attaining a high degree of skill in communicating effectively to management the results of an endeavor and securing financial and moral support for research efforts, according to Mr. Evans.

In the same field of thought, E. P. McConnell, Standard Oil Company, stated, "The next 40 years will mark the real explosive point of the scientific revolution. Companies that survive best will certainly be the ones who not only do research and development, but who do it in the most effective way. The goals before us are so tremendous that these managements who do not keep their research philosophies up to date may very well fail to meet the prime objective of contributing to the profitability of the enterprise. A management whose research thinking still is in terms of the way things were done in the 1930's, the 1940's or even the 1950's had better wake up—it may already be obsolete."

Echoing the words of Mr. Potter, he called for greater emphasis on basic research, evaluation of programs at periodic intervals and constant reaching for new goals.

On the final afternoon of the conference, representatives were taken on a tour of the A. G. A. Laboratories in Cleveland. Current projects, testing procedures and methods for evaluating appliance performance were shown. The Laboratories staff provided detailed information on programs now under way.

Facts and figures

(Continued from page 20)

free standing ranges and 28,471 gas dryers shipped in February, a decline of 21.8 and 26 per cent respectively. The decline in gas range shipments can be

explained, however, by the prevalent wait-and-see attitude of the consumer since the replacement market is important in total shipments of this appliance. Only sales of gas fired furnaces and boilers, which are not greatly dependent upon the replacement market, registered

increases of 1.5 and 0.7 per cent respectively.

In general shipments for the month of February have continued the decline of previous months. The rate of decline, however, is not as severe and seems to be bottoming out.

Schoolmen view turbine display



"Gas Does the BIG Job," according to Solar Aircraft Co. display of gas turbines for schools



AiResearch, Division of Garrett Corp., displayed this gas turbine at school administrators meeting

Use of gas turbines as complete power centers for school buildings received a boost during the West Coast regional convention of the American Association of School Administrators, held in San Francisco.

In cooperation with A. G. A.'s Industrial and Commercial Gas Section, ten-foot displays were exhibited prominently by two manufacturers, Solar Aircraft Company and AiResearch Manufacturing Company of Arizona.

The Solar exhibit was worked out in blue and white colors. At the top of the back wall, in large white letters on a blue board, was shown the identifying American Gas Association sign. A three-foot gas flame in blue and white appeared at the left of the display. Technical diagrams of the equipment appeared on the back wall at the right. Prominently displayed on a red background in the center of the board was the slogan, "Gas Does the Big Job."

Solar's gas turbine, model T-150, ap-

peared on a stand at the front of the display. A small table was provided for explanatory literature.

The AiResearch display was presented in red, white and blue colors. Here also the American Gas Association sign in large backlit white letters appeared, along with the gas flame and the slogan.

A cut-away rendering of a gas turbine was attached to the wall, and an AiResearch gas turbine unit was placed on a table at the front of the display. Sample literature was handed out by the exhibitor.

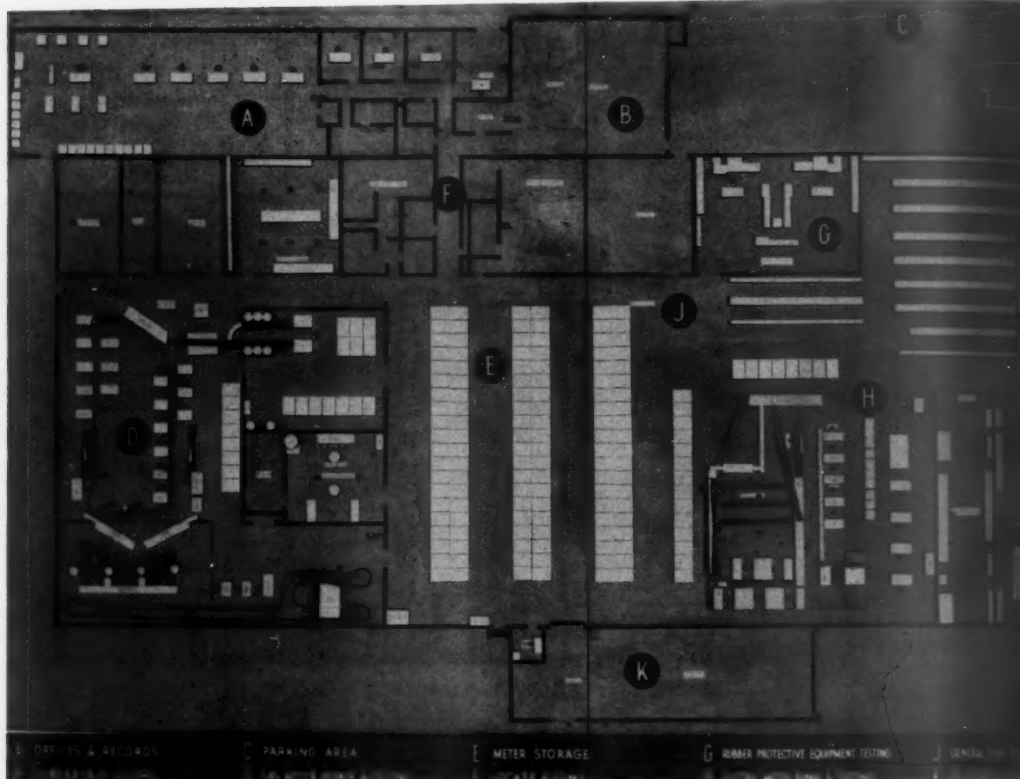
Both exhibits were staffed by gas turbine sales specialists during the run of the convention. In addition, a school promotion specialist, sent by Southern Counties and Southern California Gas Companies of Los Angeles, worked actively throughout the convention to call attention of all the attending school officials to the gas turbine displays and to see that they were given complete product presentations.

The exhibitors reported a considerable number of live leads from school administrators as a result of the displays. AiResearch, on the basis of the successful experience in San Francisco, announced intentions to enter a similar exhibit at the Philadelphia regional convention of the same national educators' organization.

A number of other manufacturers' exhibits also stressed the importance of air conditioning in schools. Among those represented were American Air Filter Company, Herman Nelson division; John J. Nesbitt, Inc.; and Carrier Air Conditioning Company.

Interest in the gas turbine as a total power supply for schools recently has been stimulated also by publication of the study, "A New Look at New Schools," by Goleman and Rolfe, Houston, Texas, engineering and architectural firm. Results of the study were published in the March, 1961, issue of the MONTHLY.

Modern meter maintenance



Floor plan of Consumers Power Company's meter operations center outlines centralized system of meter maintenance

By A. W. RAUTH

Consumers Power Company

Gas meter maintenance is a necessary expense for all gas operating companies. As in most operations, labor and supplies are important items. Reductions in such costs are realized by more efficient operation and by automation. Automation has the added advantage of eliminating human errors. Many companies have made changes in these directions; others are investigating possibilities. Consumers Power Company is one company which has made changes.

Consumers Power Company is a combination electric and gas company. Its

gas operations cover an area of 6,342 square miles serving 136 cities and incorporated villages located in 31 counties of the lower peninsula of Michigan. At the present time the Consumers Power Company owns roughly 570,000 gas meters. About six and one-half years ago the meter operations were changed by centralization in one building near Jackson, Michigan.

The facility is a one-story building, with no basement, and with provision for air-conditioning. At the present time only the office, the in-proving room, and the large meter room are air-conditioned. This centralization practically closed seven meter departments located throughout the gas territory. It is still in opera-

tion with not too many changes in layout of the building or the equipment and is still recognized as one of the most modern meter shops in the country.

The shop was originally laid out on the basis that the meters should be handled as few times as possible and moved the shortest distance possible. It was also decided to make the operation automatic within practical and economical limits. One of the main objects was to eliminate the human element insofar as practicable.

The standard meter for Consumers Power Company residential service is the Class 175 hard case meter. These meters therefore received major consideration in laying out the building and



Meters to be checked are carried to and from work benches on an endless conveyor system



This single-story building houses Consumers Power Company's centralized meter operations

equipment; however, since there were some 150,000 tin meters on the system, provision had to be made for such meters.

The accompanying drawing shows the floor plan including the gas meter operations, electric meter operations, storage area, offices, and other facilities for the building's entire population. In looking at the plan, it will be seen that the meters are brought in at the point marked K and stored in the left hand area of the part marked E. In this same area meters that are ready for field service are stored after they have been processed in the shop. The gas operations are shown on the left half of the drawing or to the north of the building.

A brief explanation of the floor plan

for the gas operations will perhaps give a better picture of the entire operation. Just to the left of the letter E (meter storage area) on the floor plan is an entrance to the air-conditioned, in-proving room. There are six provers in the upper left-hand corner of this room and two in the lower left-hand corner. The two in the lower corner are 10 cubic-foot provers. The others are 5 cubic-foot provers. The two wide black lines between the six provers in the upper left-hand corner represent belt conveyors. One man operates these six provers and will in-prove and record both open and check flow accuracies of at least 200 meters each day without any trouble.

After he has completed his proof

and recorded the accuracy of the meters, the meters are unloaded, by means of conveyors, on a large table to the left of the prover room. From here they start the journey to be completely overhauled or repaired as necessary.

The small black line that makes an enclosed circle to the left of the above mentioned provers is an endless conveyor provided with baskets. This conveyor makes a continuous circuit and distributes meters to and takes them away from the work benches. In the lower left-hand corner are six more provers and six short belts represented by wide black lines. This is the outgoing or adjusting prover room. Just to the right of these provers is the area used

for topping the meters. Along the very bottom of the area used for gas meter operations is another small line making a complete enclosure. This is an overhead conveyor. This conveyor takes all meters through the paint booth for painting.

All the meters come in at K they make a complete circle through the gas meter operations department and end up in the storage area. The larger meters are brought in at K and are processed in the area between the in-proving room and the paint booth. This also eliminates the necessity of moving the large meters great distances.

One of the important features of the meter shop is that it represents the first installation of one of the most complete automatic schemes for proving gas meters. The scheme eliminates the human element in determining the accuracy of gas meters. The same scheme is now used in many gas meter shops.

The automatic testing scheme makes use of an electric eye and a light beam. The light beam and electric eye are in one unit so that the operator can focus a light beam on the circle of the test or proof pointer of the meter index, the

theory being that the pointer on the index will cut the light beam at exactly the same point to start the test operation as it will cut the light beam at the completion of the operation. Once the meter is connected and a check made by pushing a button to see that the connections are leak-proof, the electric eye is then focused on the index prover circle, the flow rate is set, and the operator pushes a button.

When the button is pushed, the meter starts operating by means of air from the supply source. At the same time the prover bell is lifted by means of the air from the supply source and automatically leveled to zero. Then when the light beam is cut by the proof pointer (after the prover is automatically zeroed), the air flow to the meter is automatically shifted from the supply source to the prover bell. This is done so rapidly that the change can hardly be noticed by means of a U tube. When the prover hand has made a predetermined number of revolutions, the entire operation is stopped by means of cutting the light beam and the accuracy is shown on a fine reader. Fundamentally the same scheme is used for vacuum testing.

The above means of reading the accuracies have been enlarged so that the readings may be shown on a counter or may even be printed on a card. The air supply is controlled and shifted from one point to another by means of electrically operated valves.

After the meters are painted and ready for service, they are placed in cargotainers. The cargotainers can be handled by means of a fork lift or by means of a dolly, and are suitable for stacking. Meters are shipped to and from the central meter building by means of tractors and trailers. They are loaded in trailers with the cargotainers by means of a fork lift.

All records are kept and statistical data recorded by means of IBM machines. Since both gas and electric meters are processed in the same building, the same tractors and trailers are used for shipping meters to and from the field. Similar data cards are used for both gas and electric meters; therefore, the IBM machines are suitable for both gas and electric meter records. The entire operation of the shop and office has been more than satisfactory and the economics have been better than originally expected.

Piped cooling

(Continued from page 5)

ordinarily be used for house heating and cooling equipment would be available for rental.

The East Ohio executive withheld any predictions on possible revenues from the undertaking, pointing out that until actual plans for buildings are completed, outlining their number and size, it is impossible to speculate. However, the company has approached architects and engineers for a detailed feasibility study.

According to Mr. Ramsdell, East Ohio would take advantage of proximity to an abundant supply of water which would be used in the cooling operation. Water from Lake Erie, immediately north of the Erieview area, would provide the system's condensing water, thus eliminating the need for the massive cooling towers which would be needed for such a large cooling operation.

A prototype of the cooling installation, where Lake Erie waters are used for condensing water in the cooling cycle, has been included in the construction of a six-million-dollar apartment house project in Cleveland. The installation uses gas for heating and cooling.

The East Ohio plant, styled architecturally to fit in with other Erieview buildings, would house offices, a dispatch center, control room and space for the gas-fired boilers and refrigeration equipment needed to supply chilled water and steam.

Two sets of pipelines, consisting of supply and return lines for chilled water, and supply and return lines for hot water or steam, would loop their way through the area.

During cold weather, steam, generated by gas-fired boilers, would be piped to each building to provide heat. During warm weather, chilled water, produced by the highly effective absorption principle, would provide cooling.

The water would be chilled in huge absorption machines, activated by steam from the gas-fired boilers. Water piped to the absorption machines and then back to the lake would serve as condensing water.

Mr. Ramsdell said that the company sees the project as an important development for several reasons. It would enable East Ohio to play an important part in Erieview, while expanding its business, and the project, with the large volume of summer cooling, would be important

in increasing the company's summertime load.

Mr. Ramsdell explained that the variance in demand for gas between summer and winter months, which presents a major supply problem for gas utilities, is particularly severe for East Ohio, since 93 per cent of its more than 800,000 customers use gas to heat their homes. The result is the company is called upon to supply as much as eight times more gas on a winter day as a summer day.

Mr. Ramsdell, like many gas industry executives, looks to air conditioning as a means of cutting down the variance. East Ohio has been particularly aggressive in obtaining this summer load. Many new buildings in northeastern Ohio, including a 21-story office building, two large department stores, two hospitals, and numerous large apartment houses are gas air conditioned.

The East Ohio president does not hesitate to suggest that the company's Erieview proposal could be a door-opener to similar projects in other large urban areas, and possibly in large home developments. East Ohio serves 195 northeastern Ohio communities, including Akron, Canton, Youngstown, Warren and Massillon.

Fuel cell

(Continued from page 12)

methane plus steam in a high-temperature cell. Conversion of methane to hydrogen within the cell obviates the need for external reforming equipment, and it is likely that investment cost for a molten carbonate battery will be lower than that for a cation exchange battery of the same capacity. Further, the possible over-all thermal efficiency with internal reforming is greater, since the heat requirements for the reforming reaction are approximately equal to the heat release due to cell inefficiencies. A power pack for home installation using high-temperature fuel cells would provide for the addition of steam to the natural gas feed, the addition of flue gas (as a source of CO_2) to the air feed in the case of molten carbonate cells, and underfiring with waste gas from the cells to compensate for normal heat losses. There are several possibilities for utilizing the waste heat from the fuel cells, in conventional appliance functions presently used in the home.

It is recognized, of course, that high operating temperature is not compatible with the on-off, low load factor operation typical of home electrical utilization. Storage batteries would most likely be employed to raise the load factor and smooth the power demand so the high-temperature fuel cells could operate essentially continuously. Instead of providing a large power pack capable of meeting peak loads of, say, 10 kilowatts, a one kw unit operating continuously together with battery storage would be designed. The investment in storage batteries would be less than the fuel cell capacity they would supplant. Also, it is an advantage to supply electricity from storage batteries, which have flat operating characteristics (essentially constant voltage at any current density). All fuel cells have comparatively steep voltage-current curves, which require special voltage control techniques and additional investment cost.

It would probably be desirable to convert direct current to alternating current, for residential service, although this may not prove to be essential. There are several semiconductor devices presently available for this purpose, which operate with efficiencies in excess of 85 per cent, and which have investment costs that are likely to be attractive.

In the case of low-temperature fuel cells operating on high hydrogen con-

tent, reformed methane, it is technically feasible to operate on an on-off, low load factor basis. However, a storage battery system would probably be mandatory to cut down on the investment in these inherently expensive cells, most of which would not be in use except during moments of peak demand.

In summary, the high-temperature fuel cell approach, integrated with waste heat utilization and an electrical storage battery system, is an attractive development venture. Molten carbonate cells can be used at first, because much is known about their characteristics. Solid oxide cells are most desirable, in principle, and may eventually supplant the carbonate cells if research presently in progress is successful. The power pack development can be carried out so solid oxide and molten carbonate cells can be interchanged at any stage with little additional effort. The low-temperature fuel cell approach, using cation exchange cells integrated with a miniature steam reformer and shift unit and an electrical storage battery system is probably uneconomic, but careful cost studies should be made to verify this. Also, since much of the cost is involved in the cation exchange cells, the feasibility of developing lower cost acid cells to replace them should be explored.

Progress on carbonate cells at IGT

The project was initiated in March, 1960, and single-cell experimental work was begun in the early summer with porous magnesia matrices prepared by a method used by previous investigators. Improvements in matrix preparation techniques were made with the aid of the Armour Research Foundation, Ceramics Research Division.

Several nickel anode materials were tested and compared. Porous nickel battery plaques with embedded nickel gauzes (about 80 per cent porosity, 10-micron mean pore opening, manufactured by Clevite, and by Sonotone), had adequate structural strength at temperatures as high as 920 C, and showed catalytic activity similar to powdered nickel anodes. Porous silver plaques fabricated in the same manner by Clevite, with embedded silver gauzes, were satisfactory as cathodes. Also tested were cathodes formed from layers of 80-mesh silver gauze.

A cell was designed which gives good contacting and gas distribution by means of pressure fingers. The edges of the

electrodes were coined, and silver gas-kets were employed to eliminate leakage of gases at the cell periphery.

Six cells were combined into a research battery and used to demonstrate operation with methane-steam feed, and to test new component ideas. The six-cell battery was housed in a gas-fired furnace equipped for underfiring with waste gas from the cells.

Methane flow rates in leak-tight cells were as low as 50 cc/min; about 3 cc/min is the stoichiometric requirement for generation of 50 amp/sq ft.

It can be seen that an increase in cell temperature from 750 to 850 C results in a considerable improvement in cell performance. Within 0.5 to 0.75 volts, a typical power pack operating range in most fuel cell studies, the power density was as high as 28 watts per sq ft, at 850 C. For a battery with a half-inch cell thickness this leads to a maximum power/volume ratio of about 650 watts per cu ft. Smaller cell thicknesses and therefore higher power/volume ratios would be expected in prototype batteries.

Progress on solid oxide cells

One of the early objectives of the project was to search for alternate electrolytes that would avoid the various drawbacks of molten carbonates. It was most important to eliminate the need for introducing carbon dioxide with the oxidant. A study of the literature indicated that solid ionic oxides might be useful.

There are several practical requirements before a solid oxide cell can be developed. The cell should have a high current density to minimize battery size for a given duty. Therefore, the rate of diffusion of oxygen ions through the electrolyte must be high. This can be accomplished by forming a thin layer of electrolyte so that the oxygen ion concentration difference across the electrolyte per unit of thickness is large, and by choosing solid oxides with structures that permit high rates of diffusion. Furthermore, only oxygen ions should diffuse through the oxide, so the oxide layer should not contain pores or cracks which would permit passage of gaseous fuels or oxygen. The oxide electrolyte must also be adherent to the electrodes to give good contact, and inert to the fuels and oxidants so it will not change during operation of the cell.

Experimental work was begun at IGT by surveying candidate oxide solid solu-

tions by x-ray powder diffraction, and by testing ground and polished disks of stabilized zirconia in fuel cells. However, it was recognized that practical oxide cells will require oxide films on the order of one mil in thickness, and that some specialized coating technique must be used for this purpose. Accordingly, the ceramics research division of Armour Research Foundation was consulted and plans were made to test flame spraying, "solution" and "slurry" ceramics, vapor deposition, pressing, and other methods, to achieve very thin coherent oxide films with the proper crystal structure. This work was begun in January, 1961.

Another oxide film technique that shows promise is electron beam vaporization (Alloyd Corp., Cambridge, Mass.). Nickel anodes were coated with a layer of ZrO_2 -CaO solid solution about 1/30 mil thick by this technique, and the fluorite structure was obtained after the vaporization. Thus, it appears that several thin film techniques have promise.

Research program

In 1961, the program of research and development of high-temperature methane fuel cells will involve five experimental areas.

With molten carbonate cells 1) single-cell tests will be conducted on research cells to develop better electrodes, and electrolyte preparation methods, and to define effects of variables, and 2) design and construction of a 100-watt prototype battery is planned.

With solid oxide cells 1) a number of promising techniques for preparing thin membranes of electrolytes will be studied by the ceramics division of Armour Research Foundation, and 2) single-cell tests will be conducted at IGT to evaluate cell components and the effects of variables.

A fifth area of study concerns a search for promising solid oxide electrolytes, a basic study conducted at the University of Miami under a Grant-in-Aid.

In addition, engineering-economic studies are planned to develop estimates of manufacturing and other costs. Also, it is hoped to include a technical and economic evaluation of the alternative approach involving a low-temperature cell (such as ion exchange), and conversion of methane to hydrogen in separate apparatus.

Summary of related fuel cell programs

1. *Major fuel cell developments with gaseous fuels.* Industrial fuel cell research has led to two types of hydroxide cells with: 1) carbon electrodes (Union Carbide), and 2) metal electrodes (Electro-Optical Systems, Allis-Chalmers, Leeson-Bacon) using aqueous solutions of KOH as electrolyte. In addition, a hydroxide cell using a paste of hydroxide mixtures at intermediate temperatures has been studied, and hydroxide ion exchange membranes have been used.

In hydrogen ion cells, most industrial activity has been with hydrogen ion exchange membranes (General Electric, Ionics, Inc.). Also, phosphoric acid has been under study as an electrolyte at intermediate temperatures.

Carbonate cells have variations also, with: 1) molten electrolyte held in porous ceramic matrices, 2) plastic mixtures of molten electrolyte and inert filler, and 3) free molten electrolyte. In the latter case only, dual-porosity electrodes are needed.

2. *Long-range fuel cell concepts for methane.* There are two schemes recently announced that are not being developed for methane, but which might conceivably be applied if substantial advances in technology are made. The soluble-reactant or "dissolved-fuel" cell idea is under investigation by Esso and by Monsanto in the United States, and by Prof. Justi in Germany. Very interesting results have been obtained with fuels such as methyl alcohol and hydrazine dissolved in aqueous electrolytes and contacted with nonporous, nondiffusion anodes. However, more active catalytic techniques will probably be needed before feasibility with dissolved methane can be shown.

The other long-range concept is the high-temperature oxygen concentration cell that Westinghouse is studying, with carbon as fuel. The components of this cell are very similar to those of any high-temperature fuel cell, but the fuel is oxidized in the anode room, and not on the anode surface. As practiced by Westinghouse, the concept seems to have most applicability to solid fuels such as coal, for central power generation. It is not known how useful the idea might be for natural gas.

There is a third approach (not shown) that might be applicable to methane: the thermally regenerative cell concept. At present, MSA Research Corp., and

Thompson-Ramo-Wooldridge are studying cells of this type as a means of converting heat from nuclear sources to electricity. The concept can be applied to any source of heat; in the case of natural gas it would be necessary to develop a regenerator that would combust gas and utilize the heat economically for the regeneration reaction. Present work on these cells is with hydride systems, such as lithium hydride, in which the overall reactions are:

Generation:



Regeneration:



In the regeneration step, both lithium and hydrogen must be recovered and returned to the cell. A more attractive scheme might be to utilize oxide systems. Air could be the oxidant instead of hydrogen, and the regenerated oxygen need not be recovered.

Terminology

A *fuel cell* is an electrolytic cell which converts the chemical energy of a continuously fed, fluid, fuel-oxidant system directly into electrical energy. Conventional gaseous and liquid fuels, and air or oxygen, are normally used as reactants.

By contrast, ordinary cells and storage batteries, like the Leclanche cell and lead-acid battery, employ solid reactants (fuels and solid oxidants, such as zinc and manganese dioxide in the former, and lead and lead dioxide in the latter. Further, reactants and products are not continuously fed.

A *battery* of fuel cells or ordinary cells is comprised of more than one cell, connected electrically. In the case of a *fuel cell* battery, the cells are fed with fuel and/or oxidant either individually or in series. If both fuel and oxidant are fluid, the battery may also be fed *concurrently* or *countercurrently*.

A *power pack* of fuel cells is a completely engineered system, comprising a battery or batteries of cells, appropriate housing, insulation, conduits, controls for fluid flow, electricity, temperature, etc.

In fuel cells, chemical energy is converted directly to electrical energy without intermediate conversion to heat, as occurs, for example, in *thermoelectric* and *thermionic* devices and in the conventional *steam turbogenerator* method of power generation.

GAMA elects William G. Hamilton president

WILLIAM G. HAMILTON JR., president of the American Meter Company, Philadelphia, was last month elected president of the Gas Appliance Manufacturers Association.

Delegates attending GAMA's 26th annual meeting at Boca Raton, Fla., also named J. F. Ray, vice president in charge of sales for General Controls Company, Glendale, Calif., as first vice president of the association. Joseph J. Decker, president of the Plumbing and Heating division of American Radiator and Standard Sanitary Corp., New York, was named second vice president. Robert C. LeMay, manager of contract sales for the Selas Corporation of America, Dresher, Pa., was elected GAMA treasurer.

As president of GAMA, Mr. Hamilton will direct the activities of the trade group for the next year. The association represents more than 580 manufacturers of residential, commercial and industrial gas appliances and equipment. GAMA member firms produce more than 90 per cent of all the gas ranges, water heaters, clothes dryers, refrigerators, refuse disposers and heating and air conditioning equipment made in the United States.

The president previously served the association as second vice president in 1959, and as first vice president last year.

Under his direction, the American Meter Company was instrumental in originating the Gas Equipment Manufacturers' (GEM) pro-

gram of national consumer and gas industry trade press advertising. The program now is sponsored by 17 firms that manufacture equipment used in the production, transmission and distribution of gas to homes and industry.

Mr. Hamilton also is a director of A. G. A. He was instrumental in instituting the A. G. A. Distribution Achievement Award sponsored by the American Meter Company. This award is presented annually to an individual selected by the A. G. A. for his outstanding contribution to the science and art of gas distribution.

Mr. Hamilton also is a member of the Pennsylvania Gas Association, New Jersey Gas Association, Liquefied Petroleum Gas Association, Canadian Gas Association, Southern Gas Association, and the Metal Manufacturers Association of Philadelphia.

He is a past mayor of the Guild of Ancient Suppliers, serves on the credentials committee of the Ancient Gassers and is a member of the Society of Gas Lighting.

Mr. Hamilton joined the American Meter Company in 1927 as an engineer. Since then he has served as sales engineer, assistant plant manager and vice president in charge of sales. He was appointed president on April 18, 1951.

He attended Chestnut Hill Academy and William Penn Charter School, both in Philadelphia, and Swarthmore College, Swarthmore, Pa. He is a native of Philadelphia.

Mid-West Gas Association convenes in Omaha, elects new officers

SALES and the future of the gas industry were dominant themes at the 56th annual Mid-West Gas Association convention held in Omaha, Nebraska, on March 27 and 28.

More than 400 delegates heard the sales messages presented by Sam Schneider, Crosley Broadcasting Corporation; Bob Fink, The Gas Service Company; and William Hazlett



New officers of Mid-West Gas Association: seated, C. J. Math, Iowa-Illinois Gas & Electric, president; K. W. Person, Minneapolis Gas, 1st vice president. Standing are A. D. Schmidt, Northwestern Public Service, 2nd vice president; J. J. Finnegan, Northern Natural Gas, secretary-treasurer

Industry news

Arkla making gas meters

IN Russellville, Arkansas, a new manufacturing plant is turning out domestic gas meters for the whole natural gas industry at the rate of 100 units daily.

E. R. Gilmore, general manager of the meter division of Arkla Air Conditioning Corporation, said that the plant's capacity is 500 units of residential type meters daily. Production started shortly after January 1, 1961—less than two years from the inception of a development program inaugurated under Gilmore's direction by Arkansas Louisiana Gas Company, which owns Arkla Air Conditioning Corporation.

Presently employed at the plant are 30 persons, including the original development group which will continue to work on developing gas measurement devices. When full manufacturing capacity is attained, 80 persons in the skilled category will be used.

Upson, noted author-lecturer whose "Alexander Botts" stories have appeared periodically in the *Saturday Evening Post*.

Addressing the convention on the future of the industry were Lester Potter, president of A. G. A.; D. W. Weir, Arkansas-Louisiana Gas Company; Francis X. Welch, editor of *Public Utilities Fortnightly*; and Dr. Martin Elliott, director of the Institute of Gas Technology.

The subject of effective management was presented by the University of Michigan's Dr. George Odiorne, while community relations were discussed by Minneapolis Gas President Gerald Mullin. Don Decker, a director of the National Home Builders Association, gave his ideas toward better builder-utility relations, and the liquefied petroleum portion of the program was presented by W. A. Schuette, second vice president of the Liquefied Petroleum Gas Association.

On the distaff side, Mrs. Jessie Cartwright of the Norge Sales Corporation described the present status of the gas business, while Mrs. Shirley Pemberton of Robertshaw-Fulton Controls Company explained the latest in oven controls to a special ladies' luncheon.

New officers of the association elected at the meeting were: C. J. Math, Iowa-Illinois Gas & Electric Co., president; K. W. Person, Minneapolis Gas Co., first vice president; A. D. Schmidt, Northwestern Public Service Co., second vice president; and J. J. Finnegan, Northern Natural Gas Co., secretary-treasurer.

Next year's convention will be held in Minneapolis on April 9 and 10.

World Power Conference to be held at Melbourne, Australia in October

THE UNITED STATES National Committee of the World Power Conference has initiated planning for participation in the sixth plenary meeting of the conference to be held in Melbourne, Australia, October 20-26, 1962.

Twenty technical papers have been allotted to the United States by the Australian National Committee, host for the 1962 meeting.

The theme selected for the 1962 plenary meeting is "The Changing Pattern of Power." Development of this theme is expected to emphasize the changes that have taken place in all power production, transportation and utilization techniques since the fifth plenary meeting in 1956, and to include forecasts of expected future developments. The papers and discussions will be grouped as follows:

Division I provides for (a) discussion of energy resources based on the World Power Conference Survey of Energy Resources and the United Nations "J" series of publications, and (b) summaries prepared by each National Committee dealing with past and expected future developments in the exploitation and use of all primary sources of energy.

Division II provides for papers dealing with the production and amelioration of primary sources of energy.

Division III covers the transformation of primary to secondary energy and transportation of energy.

Division IV deals with the utilization of primary and secondary energy with subdivisions determined on the basis of broad classes of user.

Division V will be devoted to economic evaluation of alternative energy sources.

The World Power Conference Survey of Energy Resources, to be discussed under Di-

vision I, will be released as a new publication prior to the Melbourne meeting. It replaces the former World Power Conference Statistical Year-Book and will be issued at six-year intervals on the occasion of each plenary meeting.

The United States Committee, one of 59 national committees from all over the world making up the membership of the World Power Conference, is composed of three major groups of participating members. They are (1) the professional engineering societies, currently including the American Society of Civil Engineers, the American Institute of Mining, Metallurgical and Petroleum Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, and the American Institute of Chemical Engineers; (2) the industrial, utility, or similar associations, comprised of the Association of Edison Illuminating Companies, Edison Electric Institute, and the American Gas Association; and (3) the federal and state government bodies, composed of the Atomic Energy Commission, Federal Power Commission, Bureau of Mines and Bureau of Reclamation of the Department of the Interior, the U. S. Army Corps of Engineers, and the Department of Agriculture's Rural Electrification Administration.

The affairs of the United States Committee are managed by an executive board of nine members, comprised of three members from each of the above-named groups. Re-elected for the ensuing year at the January 23 annual meeting were the following national officers: Francis L. Adams, chief, Bureau of Power, Federal Power Commission, chairman; and James N. Landis, vice president, power division, Bechtel Corporation, vice chairman. The secretariat for the committee is fur-

nished through the Engineers Joint Council, 29 West 39th Street, New York 18, New York. All communications should be directed to the Secretary, U. S. National Committee, World Power Conference, at that address.

The World Power Conference, formed in 1924, is a non-government international organization with headquarters in London, England. Its objectives as stated in its constitution are "the development and peaceful use of energy resources to the greatest benefit of all, both nationally and internationally by: (1) considering the potential resources and all the means of production of energy in all their aspects; (2) collecting and publishing data on energy resources and their utilization; and (3) holding conferences of those concerned in any way with surveying, developing or using energy resources." The conference's International Executive Council, whose present chairman is Sir Vincent de Ferranti of England, meets annually in various cities of the world to carry on the continuing business of the organization. Plenary meetings of the World Power Conference are held every six years and sectional meetings every two years.

Membership in a national committee is not a prerequisite to participation in the technical meetings of the World Power Conference, but all participants must register through their national committees. Interested parties in the United States should write to the U. S. National Committee for any information desired on plans for participation in the Melbourne meeting. Copies of the technical program are now available and registration forms for attendance may be obtained sometime in 1961 when they are received from the Australian National Committee.

C. A. Olsen Company tests thermoelectric-powered gas furnace



Ronald N. Campbell, president of the C. A. Olsen Manufacturing Co., displays new gas furnace that powers own blower with thermoelectric generator

A NEW gas furnace that drives its own blower with power from a thermoelectric generator—the largest ever applied to a residential heating system—is under development by the C. A. Olsen Manufacturing Co., Elyria, Ohio.

Ronald N. Campbell, president of the company, said the thermoelectric generator, rated at 130 watts, converts the heat of burning gas directly into electricity, producing sufficient power to drive a full-size blower in the furnace.

"This application of thermoelectricity to a gas-fired, forced-air furnace brings a number of significant improvements to the conventional home heating unit," Mr. Campbell explained.

"First, the reliability of the new unit is greatly increased because it doesn't depend upon an external electric power source," he said. "If a severe storm caused a power failure, for example, the operation of a 'thermoelectric furnace' would be unaffected."

"Installation costs are lowered since no electrical connections, as compared to the conventional gas furnace, are required. In addition, the built-in power source provides

savings in the monthly electricity bill."

Mr. Campbell pointed out that inherent characteristics of the thermoelectric generator, which contains no moving parts, make it possible for the new furnace to achieve a more constant and uniform air temperature in the home.

"Company engineers have been working on this new furnace for more than two years, and the project has now entered the final phase of development. Our objective is to produce a central heating, forced-air furnace with its own source of power using a commercially available blower, while at the same time complying in every respect with the standards set by A. G. A."

During recent tests on an experimental unit, according to Mr. Campbell, the thermoelectric generator produced 130 watts at approximately 9 volts.

The basic component of the thermoelectric generator is a thermoelectric couple, which consists of a junction of two dissimilar semiconductor-type materials. If one side of the couple is heated, raising its temperature above that of the other side, an electric current is generated in the junction.

Companies join in developing fuel cell

NORTHERN NATURAL GAS COMPANY and Houdry Process Corporation of Philadelphia have established a joint program to develop a natural gas fuel cell.

Announcement of the joint venture was made by M. L. Mead, senior vice president of Northern, and T. A. Burtis, Houdry president.

"The research program will be conducted at Houdry's Linwood, Pa., laboratories where fundamental fuel cell research has been in progress for quite some time. We are very hopeful that this joint venture will meet with success," Mr. Mead said.

The goal of the two companies is to produce electricity right in homes and factories by using a fuel cell powered with natural gas which will supply all of the energy requirements of a household or business at

costs significantly less than current sources. Development of the natural gas fuel cell will be one of the greatest steps forward in the energy field in modern times, according to Mr. Mead.

"A fuel cell resembles a storage battery which is continually recharged by a supply of fuel and air. As the fuel and air are fed into a cell, a catalyst performs a marriage of the elements, directly producing electricity without the complex equipment required under the standard system," Mr. Mead said.

Characteristically, the fuel cell has more than doubled the fuel efficiency of a conventional electrical generating system. An additional benefit would arise because the energy arriving through the natural gas service line would not be subject to interruptions from adverse weather or storms.

Merger announced

GREELEY GAS COMPANY, now serving 36 Colorado and Kansas communities, has purchased the assets of the Minnesota Natural Gas Company, which has 5,250 customers in four southern Minnesota towns: Worthington, Windom, Lakefield and Mountain Lake.

The transaction, completed early in February, was revealed in a joint announcement by Greeley Gas president and board chairman, Gerald L. Schlessman, whose administrative offices are in Denver, and by W. J. Allison and E. L. Williams, president and vice president respectively of the Minnesota system.

The Minnesota Natural Gas property, which has gross revenues of approximately \$1,450,000 a year, will operate as a division of Greeley Gas Company, and will continue to buy its gas supply from Northern Natural Gas Company.

Northern Natural names Blease



Ernest B. Blease

ELECTION of Ernest B. Blease as vice president of Northern Natural Gas Company has been announced by Northern President W. A. Strauss.

Mr. Blease will head the newly created regulatory and forecasting division at Northern. He will direct the preparation of applications to the Federal

Power Commission for system expansion and rate revisions, supervise preparation of the company budget and direct the company's long-range forecasting activities.

He has been with Northern since 1951, serving as director of rate and budget before his recent election. His experience before joining Northern included 14 years with the Federal Power Commission in Washington, D. C.

Selas elects Bigelow

C. GLEN BIGELOW, JR., has been elected vice president—research, Selas Corporation of America, Dresher, Pa., according to an announcement by F. O. Hess, president.

Mr. Bigelow joined Selas in March 1958 as director of research, coming from American Machine and Foundry Company where he had served as technical director of the General Engineering Laboratories, Greenwich, Conn., and new products secretary in the firm's New York headquarters.

He was also previously associated with Loftus Engineering Co., Pittsburgh, Pa., as assistant chief engineer, and with U. S. Gypsum Company as research engineer at the Building Materials Research Laboratories, Chicago, Ill.

Mr. Bigelow received his Bachelor of Science degree in Mechanical Engineering from Purdue University and later took graduate courses at Carnegie Institute of Technology.

Lea is sales manager

J. W. LEA has been named general sales manager for Atlanta Gas Light Company. In this capacity he will be responsible for residential sales in all areas served by the company.

Assisting Mr. Lea will be Marion R. Kays, Jr., sales manager, who recently joined Atlanta Gas Light Company.

Mr. Lea, who has been manager of the commercial sales department, has been with the company for 32 years, all of it in sales. Before joining Atlanta Gas Light in 1929, his previous business experience had also been in sales.

Gollnick opens offices

ROBERT L. GOLLNICK, evaluation geologist, has announced the opening of his consulting offices in Houston, Texas.

For the past ten years he had been staff geologist with Ralph E. Davis Associates and prior to that was senior evaluation geologist with Humble Oil and Refining Company.

R. J. Stuart promoted



R. J. Stuart

JOHN WOOD COMPANY announces the election of Robert J. Stuart as vice president in charge of industrial relations. John Wood Company is a manufacturer of gas water heaters and other products.

Mr. Stuart, who is a graduate of Grinnell College and the University of Iowa Law School, joined John

Wood Company in 1954 after several years' service as a special agent of the Federal Bureau of Investigation, and has been in charge of the company's labor relations since 1956.

Schaefer is vice president

FREDERICK C. SCHAEFER, former sales manager of American Gas Furnace Co., Elizabeth, N. J., has been appointed executive vice president of the firm. With the company for 25 years, he was sales manager for 18 years.

He is a graduate of Union Junior College. He is a member of the American Society for Metals and has lectured many times before its various chapters throughout the country. Also, he has written technical articles for publications of the metal-treating industry.

He is chief of the industrial division of the Gas Appliance Manufacturers Association and has served on the faculty of the Industrial Gas School of A. G. A.

Turbine seminar announced

A SEMINAR on the Industrial and Commercial Use of Gas Turbines will be held in Houston, June 15-16, the Southern Gas Association has announced.

The seminar—first of its kind conducted in the natural gas industry—follows closely the recent publication of a research report on the application of a gas turbine to supply all the energy requirements of a secondary school building, including air conditioning and high-frequency lighting.

The report, entitled "A New Look at New Schools," describes the application of a gas turbine to supply both high-frequency power for lighting and conventional power for convenience outlets in a secondary-school building. The waste heat from the turbine is recovered and run through a boiler to develop steam to heat the building, heat water, and to operate an absorption chiller system to provide cooling.

I. E. Rowe, chairman of the S.G.A. Heating and Air Conditioning Committee, sponsor of the seminar, said a broad program to be of interest and value to gas company engineering personnel as well as commercial and industrial sales personnel is planned. Particular attention will be given to different applications of the gas turbine, economics of operation, and available equipment.

Blue Star Home display proves popular



One of the top ten booths at the recent Lansing, Michigan "Home-Arama" was this exhibit of the Consumers Power Company. Over 50,000 people saw the booth, which was designed specifically to serve both as an information center and as a tie-in display for the Blue Star Home Program.

"Nothing Like A Flame" is Florida theme

THE FIRST ANNUAL convention of the newly-formed Florida Natural Gas Association will be held May 26-27, at the Americana Hotel, Bal Harbour, Florida.

Some 250 delegates from companies making up the association are expected to attend.

Theme of the convention will be "There's Nothing Like A Flame," a slogan, adapted from "South Pacific," that is calculated to answer the anti-flame promotions of the electric industry.

Chairman of the Friday session will be

John T. Bills, president of the association. Saturday chairman will be Dwight B. Sprow, vice president, The Houston Corporation.

The program will include talks by leading executives on water heating, air conditioning, financing, advertising, and clothes dryers. Jac Cushman, A. G. A. secretary, will discuss A. G. A. activities, and S. F. Wikstrom, director of the PAR program, will inform delegates on national advertising. The meeting also will include an open forum on gas industry problems in the Florida area.

Easter Cross in light



Lighted cross in windows of Iroquois Gas Corporation shines across Buffalo, N. Y. In foreground is an Easter egg house set up by the company.

Labs have mobile units

THE USE of two Chevrolet Greenbrier automobiles as mobile field inspection service units was recently announced by Frank E. Hodgdon, director of the A. G. A. Laboratories.

One inspection service car will operate from the Cleveland Laboratories and the other from the Pacific Coast Branch at Los Angeles.

The white vehicles prominently display the Laboratories' Seal of Approval on each side.

The cars are being equipped with instruments to make temperature, pressure, and gas flow measurements. In addition, standard samples of carbon monoxide and carbon dioxide will be carried. This equipment will be made available to appliance manufacturers during the routine plant visits of Laboratories' inspectors for the purpose of making accurate operational checks on their testing apparatus.

Possible use of the mobile units for in-plant testing at the time of factory inspections is being studied.

It is also anticipated that at least some test work can be conducted at the manufacturer's plant where this saving in time would justify the expense of field work.

World's Fair previewed

AN invitational preview of the New York 1964-1965 World's Fair was held April 22nd, marking exactly three years until the exposition opens in Flushing Meadow Park.

The event was attended by about 1,500 guests including federal, state and city dignitaries, diplomats from the United Nations and consular services, notables from the business and industrial fields and executives and nationally known figures from the newspaper, magazine, radio and television professions.

Robert Moses, president of the fair, was host at a luncheon and inspection of the site, where models of the fair, Lincoln Center for the Performing Arts and those of exhibitors were on display.

The model shows the gas exhibit building, which will be among the first to rise. The Brooklyn Union Gas Company is providing gas service for the fair.

Air Pollution conference

FOREIGN EXPERTS from all over the world are planning to join the nation's leading air pollution control authorities at the 54th Annual Air Pollution Control Association Meeting June 11-15 at the Hotel Commodore in New York City.

Representatives from Canada, Mexico, England, France and West Germany are expected to attend the five-day meeting. Harry A. Belyea, association president and chief air pollution control officer of metropolitan Toronto, Canada, announced.

The program for the meeting will consist of an intensive review of all aspects of the nation's air pollution control problem. More than 70 technical papers on specific problems will be delivered in 18 sessions.

Employees honor Potter



A. G. A. president L. T. Potter shows his wife, Ruby, a volume of signatures of Lone Star Gas Co. employees presented to him upon his A. G. A. election.

LILCO names three

LONG ISLAND LIGHTING COMPANY'S President, John J. Tuohy, announced the election by the board of directors of Russell M. Grogan as vice president in charge of the Office of Production, Transmission and Construction. The statement was released after an organization meeting of LILCO's board directly following the Long Island utility's annual meeting held April 18.

The utility president also announced that senior attorney, Charles R. Pierce, had been elected assistant secretary of the corporation.

Mr. Tuohy then revealed that Vincent T. Miles, LILCO's treasurer, had resigned because of serious illness. "The board of directors," he stated, "has regrettably accepted Mr. Miles' resignation."

Mr. Fred C. Eggerstedt, Jr., vice president in charge of finance was elected treasurer of Long Island Lighting Company and will hold both titles.

Russell M. Grogan has been in the utility business for thirty years. He was graduated in 1928 from the Catholic University of America in Washington, D. C. as an electrical engineer and joined the Long Island Lighting Company in 1945. After serving in various engineering capacities, he was made manager of the office he now heads as vice president, in June of 1960.

Maytag scholarships announced

TWENTY-SEVEN high school students today have been named winners of scholarships offered by the Maytag Company Foundation, Inc. The awards were announced by Foundation President Robert E. Vance, who is vice president and secretary of the appliance firm.

This year's group of scholars is composed of 26 Newton high school seniors and one Mingo, Iowa, high school student. Of the recipients, 13 have parents employed by the Maytag Company.

Humble joins in forming pipeline company

HUMBLE OIL & REFINING COMPANY announced recently that it is joining in the formation of a new interstate pipeline company to be known as the Monterey Gas Transmission Company and that it will sell to the new company, by a sale of natural gas in place in Southwest Texas, reserves of 6.2 trillion cubic feet.

At the same time, The Columbia Gas System, Inc. announced that a system company would enter into a long-term gas purchase contract under which it would purchase the gas to be produced from these reserves.

The initial shareholders of Monterey are Humble Oil & Refining Company and Lehman Brothers, the New York investment firm.

After Monterey Gas obtains a certificate of public convenience and necessity from the Federal Power Commission, it is contemplated that, subject to clearance with the Securities and Exchange Commission and any other governmental agencies involved, the

new pipeline company will be financed by institutional loans and a public offering of its securities.

John R. McMillan, former executive vice president of Monterey Oil Company, will head the new pipeline company as president. Donlin P. Murdy, former vice president of Monterey Oil, will be named vice president and treasurer of the new company. The directors will be Messrs. McMillan and Murdy, H. W. Haight, executive vice president of Humble, and Frederick L. Ehrman, partner of Lehman Brothers.

Under present plans, the new pipeline will ultimately transport more than 700 million cubic feet of gas a day from Southwest Texas to Alexandria, La., for sale to United Fuel Gas Company, principal supplier of gas to other Columbia Gas System companies.

Columbia Gulf Transmission Company, a subsidiary of Columbia Gas, will transport the gas from Alexandria to Columbia's consuming area.

Maryland-D. C. Utilities Association elects

WILLIAM S. MOORE, vice president of the Eastern Shore Public Service Company, Salisbury, Maryland, was elected president of the Maryland-District of Columbia Utilities Association at the annual business conference held in Baltimore, April 7. He succeeds H. Holmes Vogel, vice president, The Chesapeake and Potomac Telephone Companies, who was elected a director of the association.

Officers and directors, besides Mr. Moore and Mr. Vogel, elected to serve in the ensuing year are:

1st Vice President: Thayer B. Seese, general manager, Conowingo Power Co.

2nd Vice President: Donald S. Bittinger, president, Washington Gas Light Co.

Treasurer: Raymond C. Brehaut, president, Frederick Gas Co., Inc.

Secretary: Robert C. Carder, manager, Rate and Contract Dept., The Potomac Edison Co.

Directors: Arthur P. Clow, vice president, The Chesapeake & Potomac Telephone Co. of D. C.; George B. Daniel, president, Citizens Gas Co.; John B. Duvall, vice president, Baltimore Transit Co.; James M. Easter, president, Baltimore & Annapolis Railroad Co.; Robert G. MacDonald, president, The Potomac Edison Co.; L. Mercer Smith, vice president, The Chesapeake & Potomac Telephone Co. of Md.; Robert W. Wilson, vice president, Potomac Electric Power Co.; J. Theodore Wolfe, chairman of the board, Baltimore Gas & Electric Co.

The Association voted to hold its fall meeting again in Virginia Beach, Virginia, on September 15 and 16.

Worthington markets new single-stage portable compressor

WORTHINGTON CORPORATION has announced the development of a new line of single stage portable compressors, which will be readily available in sizes up to 250 feet.

According to Frank J. Nunlist, vice president, operations, "Worthington single stage rotary compressors will be produced in sizes most in demand, at lower operating costs, lower maintenance costs, and with greater reliability."

Reported to be the simplest design on the market today, the new Worthington line carries a full year warranty as compared to current 90 day warranty practices.

Worthington Mono-Rotor units have proven themselves after three years of intensive field testing in every weather and temperature condition from Alaska to Argentina, according to Fred B. Seel, general manager, construction equipment division, where the new line was developed and manufactured.

The Mono-Rotor has 79 parts as compared to 213 parts in the old two-rotor, two stage models. This simplicity, according to Mr. Seel, results in a compressor 20 per cent lighter.



Highlights of cases before the Federal Power Commission

Bureau of Statistics, American Gas Association

Certificate cases

● **Cities Service Gas Co.** has received approval of its budget-type application to construct natural gas facilities to expedite the acquisition of new gas supplies when available. The over-all cost will not exceed \$3 million and single projects limited to a cost of \$500 thousand.

● **Michigan Wisconsin Pipe Line Co.** was authorized to build natural gas facilities to enable it to take an additional 75 million cubic feet of gas daily from Northern Natural Gas Co. The authorization covers about 88 miles of pipeline and 3,000 additional horsepower in compressor capacity at an estimated cost of \$6.6 million. The additional gas supply will benefit existing customer companies serving Iowa, Michigan, and Wisconsin. Part of the project includes an extension to Barbaroo, Wisconsin where three companies would initiate natural gas service in several communities in central Wisconsin.

● **Montana-Dakota Utilities Co.** has filed an application seeking authority to expand its system, at an estimated cost of \$4.3 million, to secure additional gas supplies and to provide continuous service to customers by way of two sources of supply. The project includes converting the Tioga-Minot intrastate pipeline to a part of the interstate system by joining Minot and Bismarck with a 106 mile 12¾ inch pipeline. Laterals and other appurtenances also are proposed as well as new service to six communities and an air force base along the new route.

● **Northern Natural Gas Co.**, in a decision filed by Presiding Examiner Binder, has been authorized to build new pipeline facilities, at an estimated cost of more than \$37.5 million, to increase system sales capacity by 174 million cubic feet of natural gas per day. The decision disposed of three certificate cases involving a combined total of 382 miles of pipeline and the addition of 20,660 horsepower in compressor capacity, together with appurtenant facilities. In addition to allocating 75 million cubic feet daily to Michigan Wisconsin Pipe Line Co., the balance of 99 million cubic feet daily of new gas supply would go to existing customers in Illinois, Iowa, Michigan, Minnesota, Nebraska, South Dakota, and Wisconsin. In addition, the combined project, including the Michigan Wisconsin Pipe Line allotment, would permit the inauguration of natural gas service in 24 communities, 2 military establishments, and a state prison. In another case, the FPC adopted a decision by a presiding examiner authorizing the company to deliver natural gas for use in a taconite processing plant, and in two communities in Minnesota. This authorization involves construc-

tion of about 76 miles of pipeline and 5,400 horsepower of additional compressor capacity at a combined cost estimated at \$6.3 million.

● **Texas Gas Transmission Corp.** proposes to build, over a 36 month period following authorization, natural gas facilities having a total cost not in excess of \$6 million. Not more than \$2 million will be expended in any one year. The cost of a single project would not exceed \$1.3 million. The company would use the facilities to determine the capacity, deliverability and security of prospective gas storage reservoirs.

● **Transcontinental Gas Pipe Line Corp.** has filed a budget-type application covering natural gas facilities not exceeding a cost of \$1.5 million, and single projects limited to a cost of \$500 thousand for the purpose of attaching new gas supplies when feasible.

● **Trunkline Gas Co.** has filed an application to construct nearly 101 miles of large diameter pipeline and to add 3,000 horsepower compressor capacity at each of 8 compressor stations at an over-all cost estimated at \$18 million. These facilities will be used to increase sales capacity to Mississippi River Fuel Corp. and to Illinois Power Co. by 25 million cubic feet daily to each, 6 million cubic feet daily to Michigan Gas Utilities Co., and smaller increases to several other companies. In another action, the company received authorization of its budget type proposal to construct facilities during 1961 with a total cost not exceeding \$2.5 million. Individual projects will not exceed a cost of \$500,000.

Rate cases

● **Cities Service Gas Co.** has been ordered to refund \$4,431,000 to 62 wholesale customers in Kansas, Missouri, Nebraska, Oklahoma, and Texas, and about \$516,000 to industrial rate customers. The refund follows reduction to \$5,048,000 of a proposed \$10,512,000 annual rate increase which had been collected since November 23, 1959. The settlement established a rate of return at 6.25 per cent in lieu of the requested 6.75 per cent return.

● **Kansas-Nebraska Natural Gas Co.** has been allowed \$482,000 of a proposed \$650,000 annual wholesale natural gas rate increase which has been collected subject to refund since October 1, 1957. The company must refund the difference, plus a \$74,000 purchased gas cost adjustment to its 8 utility customers in Kansas and Nebraska. The commission reduced a requested 6.7 per cent rate of return to 6.5 per cent. In arriving at the 6.5 per cent return, 10.8 percent was allowed on common

equity and 1.5 per cent on deferred income tax accruals.

● **Manufacturers Light and Heat Company's** proposed rate settlement has been conditionally approved. The settlement covers a proposed \$1,645,000 annual wholesale rate increase made effective April 5, 1960, subject to refund. Refunds of \$2,050,000 not only includes the period from April 5 to November 1, 1960 but also includes additional refunds based on reduced rates to be computed by the company and put into effect on November 1, 1960. The agreement contained a reduction of 2.36 cents per thousand cubic feet in the commodity charge and retained a \$3.10 demand charge. The settlement was conditioned upon a demand charge no higher than \$2.90 per thousand cubic feet, and possibly lower in the event supplier rates are reduced.

● **Mississippi River Fuel Corporation's** proposed \$896,000, or 2.7 per cent, annual wholesale natural gas rate increase has been suspended until June 15, when it may be put into effect, subject to refund. The higher rates would affect 16 customers in Arkansas, Illinois, and Missouri. The increase is predicated upon a proposed increase by a supplier and the need for a 6.5 per cent rate of return.

● **Northern Natural Gas Company** received an interim order, in a pending natural gas rate increase, reducing the requested 6.75 per cent rate of return to 6.25 per cent. This action requires new rates to be filed, reflecting the reduced rate of return, and a plan for refunding the excess amounts collected since December 29, 1959, the effective date of the increase. Staff computations indicate that refunds of approximately \$3.4 million will be made from the proposed \$9.8 million annual wholesale rate increase which was applicable to 35 utility customers in Minnesota, Iowa, Nebraska, South Dakota, Wisconsin, and Kansas. In arriving at the appropriate rate of return, 10.5 per cent was allowed on equity capital and 1.5 per cent on more than \$8 million in deferred tax accruals. Action on system-wide cost allocation was deferred until conclusion of the hearing.

● **Panhandle Eastern Pipe Line Co.** was issued an interim order in its pending natural gas rate increase application reducing its requested rate of return from 7 per cent to 6.25 per cent. The higher rates from the \$8,654,000 annual increase have been in effect subject to refund from March 26, until July 1, 1960, when they were superseded by a further proposed increase. Although the lowered rate of return will reduce cost of service about \$2.4 million, the proposed revenue from the higher rate

schedule will fail to cover cost of service by \$2.7 million. Therefore, there will be no refund under this order at this time. In arriving at the 6.25 per cent rate of return, 10.47 per cent return was allowed on equity and 1.5 per cent on deferred income tax accruals. Hearings on issues involved in the second phase of the case will commence May 2. The company serves about 60 utility customers in Kansas, Missouri, Indiana, Illinois, Ohio, and Michigan.

In other actions, the FPC has received a joint application from The Connecticut Light and Power Co. and the Housatonic Public Service Co. seeking approval of a proposed merger with the former being the surviving corporation. At the request of Mississippi River Fuel Corp., the FPC has reopened proceedings involving allocations of its natural gas pipeline capacity. The company claims the new pipeline being constructed by subsidiary Mississippi

SUMMARY OF PIPELINE COMPANY RATE FILINGS—FEBRUARY 1961

	Number	Annual Amount
Increases under suspension at beginning of month	108	\$390,525,400
Increases suspended during month	2	4,673,100
Increases disposed of after suspension	—	—
Amount allowed	—	—
Amount disallowed	—	—
Amount withdrawn	—	—
Increases allowed without suspension	—	20,900
Increases suspended and pending at end of month	110	\$395,198,500

SUMMARY OF PIPELINE COMPANY CERTIFICATE FILINGS AND ACTIONS—FEBRUARY 1961

	Number of Applications	Miles of Pipeline	Compressor Horsepower	Estimated Cost
Pending at beginning of month*	190	6,589	588,390	\$833,559,406
Filed during month	11	205	13,600	21,494,183
Issued during month	7	33	—	3,395,156
Otherwise disposed of during month	1	—	—	15,000
Pending at end of month	193	6,761	601,990	\$851,643,433

* Adjusted to include amendments and supplements to applications and modifications of certificates.

IGU Council reorganizes committees

THE COUNCIL of the International Gas Union met in London March 21 and 22 at the invitation of The Institution of Gas Engineers.

The meetings were held under the Chairmanship of B. M. Nilsson (Sweden), President of the International Gas Union, with Mr. R. H. Touwaide (Belgium), secretary general, in attendance.

The delegates of the national gas associations of Belgium, Czechoslovakia, Denmark, Federal Republic of Germany, France, Great Britain, Italy, Netherlands, Roumanian Peoples' Republic, Sweden, Switzerland and Union of Soviet Socialist Republics were present.

Mr. H. S. Cheetham, president of The Institution of Gas Engineers, welcomed the members of the council and expressed his pleasure in receiving them in London.

The council examined the reports of the different committees. Moreover, the council

River Transmission Corp. together with future storage plans will eliminate the issue of insufficient gas supplies. In another action, the commission adopted a decision by one of its presiding examiners authorizing Southern Natural Gas Co. to sell gas to Carolina Pipeline Co. The new gas supply will enable Carolina Pipeline to begin natural gas service in the communities of Conway, Georgetown, Myrtle Beach, Winnsboro, and Bethune, S. C.

SUMMARY OF INDEPENDENT GAS PRODUCER RATE FILINGS—FEBRUARY 1961

	Number	Annual Amount
Tax rate increases allowed without suspension	1	\$ 219
Other rate increases allowed without suspension	65	1,294,972
Rate increases suspended	41	97,997
Total rate increases	107	1,393,188
Tax rate decreases allowed without suspension	—	—
Other rate decreases allowed without suspension	—	—
Total rate decreases	—	—
Total rate filings (all types)	651	—
Total rate filings acted on from June 7, 1954 to February 28, 1961	52,942	—
Rate increases disposed of after suspension (during month)	31	653,942
Amount allowed	—	112,137
Amount disallowed	—	8,750
Amount withdrawn	—	533,055
Rate increases suspended and pending at end of month	3,615	\$169,660,770

GEM campaign continues

FOR THE SEVENTH consecutive year, gas equipment manufacturers are continuing this year the GEM national advertising program to help sell gas as a fuel.

GEM launched its 1961 consumer magazine advertising with an ad in the April issue of *Better Homes & Gardens* magazine. Other consumer and trade magazine ads are to appear during the year.

Reprints and two-column newspaper mats of the ads are being made available to gas utilities for local use.

Manufacturers participating in the 1961 GEM program are:

American Cast Iron Pipe Co.
American Meter Co.
The Cleveland Trencher Co.
Economy Governor Co., Inc.
Fisher Governor Co.
E. F. Griffiths Co.
Mueller Co.
Pipe Line Service Corp.
Reynolds Gas Regulator Co., Inc.
Rockwell Manufacturing Co.
M. B. Skinner Co.
The Sprague Meter Co.
Superior Meter Division, Neptune Meter Co.
The Tapecoat Company
Union Switch & Signal Div. of Westinghouse Air Brake Co.
U. S. Pipe & Foundry Co.
Vulcan Division, Reeves Bros., Inc.

Measurement course scheduled

INITIAL plans have been completed for the 21st Annual Appalachian Gas Measurement Short Course August 28-30 at West Virginia University, Morgantown, W. Va.

The short course is annually attended by measurement and control engineers and other technical personnel representing the gas and petro-chemical industries.

Subjects to be covered in the intensive three-day course will include the fundamentals of gas measurement and special sessions on domestic meters, orifice meters, large capacity meters, automatic control instruments, pressure regulators, and other related equipment. Monitored open forum discussions and actual demonstration classes in the application and servicing of gas equipment shall be offered daily.

The various classes and laboratory sessions will be conducted by 90 qualified technical men from the industry, various university professors and representatives of the United States Bureau of Mines.

Paul H. Riley of the Commonwealth Natural Gas Co., Richmond, Va. is general chairman and A. H. Reschke of the New York State Natural Gas Co., Pittsburgh, Pa. is program chairman, R. E. Hanna and R. W. Laird of the university faculty—publications, registration, exhibits and dormitory housing.

Program request and residence hall reservations on the campus should be directed to Professor R. E. Hanna of the University of West Virginia at Morgantown.

Personal and otherwise

Margaret Spader honored



Margaret Spader

MARGARET SPADER, a veteran of the Gas Appliance Manufacturers Association's public relations staff, has won the Carl Byoir Award for her work in connection with the A. G. A.-GAMA entry in the International Food Fair in London.

The project began when twelve countries, including the United States, were invited to participate in an international kitchens exhibit at the 1960 British Fair.

As matters developed, the U. S. exhibit was by far the best attended and the most widely publicized. High compliments came not only from the crowds of English people and followers of other exhibits at the Fair, but also from officials of the U. S. Department of State.

Dubbing the event "The International Cooking Olympics" to lift it out of the commonplace, Miss Spader joined a team of four home service specialists which distinguished itself in preparing a variety of regional U. S. food favorites for the edification of the London audiences.

The press of the world covered the "Olympics," and accounts of the U. S. team's exploits began to arrive in this country via transatlantic press association cables. Upon her return to New York, Miss Spader began fulfilling her assignments to the American press which showed an avid interest in recipes and cooking procedures of the other nations participating in the event.

Miss Spader credits the "enthusiastic co-operation of the entire American team" with having made the event an important contribution to international good will and gas industry prestige. Her co-workers were Mrs. Ellen Bridges, home service adviser, A. G. A.; Miss Mildred Endner, home service director, Minneapolis Gas Company; and Mrs. Elsie Alcorn, home service director, Milwaukee Gas Light Company.

Miss Spader joined Carl Byoir & Associates, GAMA's public relations counsel, in 1956 after serving for seven years as home equipment and food editor of *Living for Young Homemakers*. Prior to that she had been administrative assistant in the Betty Crocker division of General Mills.

Wolfe, Penn elevated at Baltimore Gas & Electric



J. Theodore Wolfe



Austin E. Penn

DIRECTORS of the Baltimore Gas and Electric Company have elected J. Theodore Wolfe chairman of the board. In this capacity he will serve as the company's chief executive. Charles P. Crane, formerly chairman of the board, will continue as a director and chairman of the executive committee. Austin E. Penn was elected president, succeeding Mr. Wolfe in that position. Other officers have been re-elected.

Mr. Crane relinquished his duties as chairman of the board by his own request. In doing so, he stated that it is his intention to devote more of his time to civic matters and other interests. He is currently chairman of the Airport Board of Baltimore City and chairman of the Baltimore Regional Chapter, American Red Cross.

Mr. Crane's career with the Baltimore Gas and Electric Company spans more than a half century. First employed in the office of the late Charles M. Cohn, then vice president, in 1910, he became assistant to vice president in 1919 and served in that capacity until 1938, when he was elected a vice president. He was elected executive vice president in

1946 and president in 1950. From 1933 to 1957 he served in the dual capacity of chairman of the board and president. He has been a director of the company since 1946.

Mr. Wolfe was employed by the Baltimore Gas and Electric Company upon his graduation from the Harvard Business School in 1932. A native of Leetsdale, Pennsylvania, he had previously received his A.B. degree from Pennsylvania State University, which honored him last year with its Distinguished Alumnus Award. He began his career with the local utility as a junior investigator in the methods department, moved to a staff position in the executive offices in 1933, and became assistant to executive vice president in 1938. He was elected assistant vice president in 1942, vice president in 1947, executive vice president in 1950, and president in 1957. He has been a director of the company since 1950. In 1959 Mr. Wolfe was president of A. G. A.

A native of Mount Airy, Maryland, Mr. Penn went to work for the Baltimore Gas and Electric Company in 1920 at the age of 15.

Starting as an office boy, Mr. Penn advanced through various positions in the financial departments of the company until he was appointed supervisor of statistics in 1934. He was elected assistant secretary and assistant treasurer in 1939, secretary and assistant treasurer in 1946, vice president in 1950, and executive vice president in 1957. He has been a director since 1959.

At the annual meeting of stockholders preceding the directors' organizational meeting, all 15 directors of the Baltimore Gas and Electric Company were re-elected.

Rio Grande Valley elects

AT THE ANNUAL MEETING of the board of directors of Rio Grande Valley Gas Company held in Houston March 28, three company employees were elected officers of the company, according to an announcement by L. O. Vogelsang, president and chief executive officer of the company.

William B. Wood, general superintendent of the company since 1957, was elected vice president in charge of transmission and distribution operations.

John T. Ashford, manager of production, was elected vice president in charge of production and gas development.

Robert T. McMinn, assistant treasurer of the company, was elected assistant treasurer and assistant secretary.

John Emery, assistant general superintendent, was promoted to general superintendent of the company.

Other company officers re-elected by the board of directors are Lewis O. Vogelsang, president and chief executive officer; W. H. Meredith, vice president and treasurer; N. B. Schott, secretary; W. A. Hutchison, assistant vice president, assistant treasurer, assistant secretary; O. M. Kieswetter, assistant treasurer.

Dr. Hicks a Battelle director

DR. JOHN F. G. HICKS has been named associate director of Battelle Memorial Institute, Dr. B. D. Thomas, president, has announced.

Formerly vice president of the Corning Glass Works and vice president and technical director of Corning Glass International, Dr. Hicks is a chemist with broad experience in industrial research and development and in corporate management. A former National Research Fellow and Research Associate at Massachusetts Institute of Technology, he first became associated with Corning in 1938 as a research chemist. In 1943, he was granted leave of absence to work on the Manhattan Project at Columbia University and Oak Ridge, Tennessee.

A native of Philadelphia, Dr. Hicks was graduated from the University of Washington with a B.S. degree in 1929 and an M.S. degree in chemistry in 1931. He was awarded a doctorate in physical chemistry by the University of California in 1933. He held teaching fellowships at both universities and, as a National Research Fellow, was engaged in chemical research at Massachusetts Institute of Technology prior to his association with Corning.

Willard Wiegel retires from Lone Star Gas Company



Willard G. Wiegel

WILLARD G. WIEGEL, treasurer and vice-president in charge of personnel for Lone Star Gas Company, retired April 1 after almost 33 years continuous service with the Dallas-based firm.

Mr. Wiegel began his career with Lone Star June 1, 1928 as a public relations representative following an association with an Ohio newspaper chain.

He became assistant advertising manager at Lone Star in 1932 and advertising manager in 1935.

Boston Gas elects Farnsworth, Wolff, deVaron

E. H. EACKER, president of Boston Gas Company, has announced three elections by the board of directors.

Vincent Farnsworth, Jr., of Winchester, has been elected assistant vice president and in addition to his present duties as treasurer, assistant secretary and assistant clerk, will be in charge of the company's customer contact division, customer accounting-data processing division and financial division.

Willard C. Wolff, of Wayland has been elected vice president, effective June 19, 1961. Mr. Wolff will be responsible for sales and will succeed J. J. Quinn, vice president in charge of sales since 1947, who will continue as vice president in general administrative capacities until his retirement in October.

Appointed Lone Star's first director of personnel in 1942, Mr. Wiegel assumed the additional position of treasurer in 1950. In 1958 he was elected to the post of vice president (personnel) by the firm's board of directors. Mr. Wiegel also was named a director of Lone Star Producing Company in 1958.

An active participant in church, civic, and fraternal affairs, Mr. Wiegel is a member of many local and national organizations.

Mr. Wiegel has served as: president of the Dallas Advertising League, by whom he was chosen Most Valuable Member in 1937; chairman of Dallas chapter, Texas Manufacturers' Association; treasurer and director of the Southern Gas Association; and secretary of the employee relations section of the Independent Natural Gas Association of America.

Jose deVaron of Cambridge, assistant secretary and assistant clerk of the company, has been named assistant general counsel.

Mr. Farnsworth first joined the company in 1927 and is a graduate of Yale University, class of 1924.

Mr. Wolff has been Boston branch manager since 1945 for Bryant Manufacturing Company. Prior to that he had been successively manager of domestic sales and assistant manager of the commercial department of Brooklyn Union Gas Company. He is a graduate of Dartmouth College, class of 1931.

Mr. deVaron has been assistant secretary and assistant clerk of the company since 1949. He is a graduate of Harvard College, class of 1938 and Harvard Law School.

Wendell Davis has new post



Wendell C. Davis

WENDELL C. DAVIS, immediate past president of the Gas Appliance Manufacturers Association, and former president of Cribben and Sexton Company, has left his previous position to become president and general manager of Steelcase, Inc., Chicago, manufacturers of metal office furniture and

equipment.

Mr. Davis had joined Cribben & Sexton in 1942, as controller. He became treasurer in 1943, a director and vice president in 1946 and president in 1948.

Mr. Davis also had been a director of A. G. A. and a member of the Gas Industry Development Committee.

Worthington elects Finn



William A. Finn

WILLIAM A. FINN has been elected vice president—group executive of Worthington Corporation, it was announced by Walther H. Feldmann, president. Mr. Finn was formerly general manager of the company's Harrison (N. J.) division.

A. Edwin Carter, now vice president—manufacturing, will succeed

Mr. Finn as vice president and general manager of the Harrison division.

Mr. Finn is a graduate of the U.S. Naval Academy class of 1922 and also of the U.S. Naval War College. He first joined Worthington in 1926, returning to active naval duty in 1941. He served as assistant chief of staff, commander U.S. Naval Forces in Germany in 1945 and 1946, and now holds the rank of captain, U.S.N.R. He returned to Worthington as general manager of European operations; was named general manager of the Holyoke (Mass.) division in 1955, and general manager of the Harrison division in 1960.

Mr. Carter first joined Worthington Corporation in 1958 as vice president—manufacturing. Previously he had held numerous manufacturing positions with the Ford Motor Company and Nash-Kelvinator Corporation. Immediately before joining Worthington he was manager of Ford's Rawsonville, Michigan plant.

MacDonald is Hartford treasurer

AT THE RECENT organization meeting of the board of directors of the Hartford Gas Company, Wallace A. MacDonald was elected secretary and assistant treasurer.

Mr. MacDonald joined the company in 1942 and became successively accountant, assistant treasurer, and assistant treasurer and assistant secretary. He is a graduate of the University of Notre Dame.

Daugherty is Republic Flow Meters vice president



A. C. Daugherty

also a director of Republic and a vice presi-

A. CLARK DAUGHERTY has been appointed vice president of Republic Flow Meters Company, subsidiary of Rockwell Manufacturing Company.

Prior to assuming the vice presidency, Mr. Daugherty had been executive assistant to Republic President W. F. Crawford for four years. He is

dent and director of Republic Flow Meters Canada Ltd.

A native of Wilkinsburg, Pa., Mr. Daugherty joined Rockwell Manufacturing Company in 1946 after graduation from Pennsylvania State College. In 1951, he was appointed manager of the Rockwell market research department. He became director of public relations for the company in 1953, and was appointed assistant to the president of Rockwell in 1954. Three years later he became executive assistant to the president of the company's newly acquired Republic Flow Meters Company. He was elected to the Republic board of directors in 1960.

Stone & Webster names Murphy

EDWARD J. MURPHY has been elected secretary of Stone & Webster Service Corporation.

He replaces Carl H. Conley who has retired after 38 years with the company.

The appointment was announced by President L. S. Storrs, Jr.

Mr. Murphy, assistant secretary since 1954, joined the company in Boston in 1921. He became an accountant and then an attorney by attending night classes.

He received a bachelor of laws degree from Northeastern University, Boston, in 1931.

Selas elevates Fortin



Edward L. Fortin

company in 1934,

EDWARD L. FORTIN has been elected senior vice-president and treasurer, Selas Corporation of America, according to an announcement by F. O. Hess, president.

Coming to Selas with extensive industrial experience as an accountant, purchasing agent, controller and auditor, Mr. Fortin joined the

Hupp Corporation promotes D. N. Gredys



D. N. Gredys

DANIEL N. GRE-DYS has been named general manager of Perfection Division, Hupp Corporation, according to an announcement by Don H. Gearheart, Hupp president.

Mr. Gredys, with Perfection since his graduation from Case Institute of Technology in 1935, was previously

vice president of engineering. He succeeds A. J. DeFino, recently appointed a group vice president of Hupp.

Mr. Gredys is a member of the Gas Appliance Manufacturers Association's infrared radiant unit heater group, the engineering committee of the unitary air conditioning section of the Air Conditioning and Refrigeration Institute, and the American Ordnance Association.

As general manager of Perfection, he supervises operations of the division's two plants and four major product groups.

Babcock and Hathway named vice presidents

WILLIAM W. BABCOCK was elected chairman of the board of Central Illinois Light Company and George W. Hathway was elected president at the annual meeting of the company held in Peoria March 23. They succeed Earl D. Edwards who is retiring as chairman and president.

Mr. Babcock has been associated with Central Illinois Light and affiliated companies for more than thirty years and has been vice president since 1955.

Mr. Hathway has been a vice president of

the company since 1951 and was elected executive vice president in 1956. He has been with the company since 1932. He is a director of the Central Illinois Planning Corporation and a past president of the Central Illinois Industrial Association.

All other present officers were re-elected. At the annual meeting Walter V. McAdoo, vice president of Keystone Steel and Wire Company, Peoria, and Duane A. Cullinan, president of R. A. Cullinan & Son, Inc., Tremont, Illinois, were elected directors.

Llewellyn made V.P.

MAX R. LLEWELLYN, manager of Arizona Public Service Company's gas and electric operations, has been named a vice president by the utility's board of directors.

Mr. Llewellyn will continue to manage his present area of the utility's operations.

The newly appointed vice president joined the company's predecessor utility, Arizona Edison, in 1947 as general superintendent of operating and engineering. Prior to that he served as engineer for a California utility company in Burbank.

Mr. Llewellyn was born in Salt Lake City and received his degree in electrical engineering from the University of Utah.

Sheehan takes new post

PHILIP SHEEHAN, formerly assistant to the director of the PAR Program at A. G. A., has recently taken a new position as manager, Speakers Bureau in the A. G. A. Public Information Bureau.

Before joining A. G. A. in 1960, Mr. Sheehan was coordinator of advertising and promotion for Caloric Appliance Corporation in its Southeastern division.

Among Mr. Sheehan's immediate assignments is the organization of an A. G. A.-gas industry National Speakers Bureau, a task which is being undertaken in response to a long-felt industry need for a responsible source of qualified spokesmen for gas.

Gow heads sales promotion



Ronald I. Gow

RONALD I. GOW has been elevated to the position of sales promotion manager with Whirlpool Corporation's utility sales division.

The former assistant national advertising manager succeeds Stephen E. Upton. Mr. Upton was recently appointed sales manager, gas refrigerators.

Gow's new responsibilities are described by Dwight E. Anneaux, general manager, utility division, as "to develop sales promotion programs at national and local levels, aimed toward stimulating increased consumer demand for all RCA Whirlpool appliances through the efforts of both merchandising and non-merchandising utilities."

A 1952 graduate of Western Michigan University of Kalamazoo, Gow joined Whirlpool in April, 1955 as assistant sales administration manager, range division.

Nissel a Middle West V.P.

HANS E. NISSEL, long-time public utility consultant, has been made a vice president of Middle West Service Company. The appointment was announced by R. McClanahan, president of the consultant firm.

Mr. Nissel has been active during the past 10 years as an independent consultant to public utilities in the United States on matters relating to operation, regulation and engineering economics, and has presented expert testimony before federal and state commissions.

He has also served in this same capacity for a number of large industrial firms. In addition, he has performed extensive consulting assignments.

Names in the news—a roundup of promotions and appointments

UTILITY

Atlanta Gas Light Co. has announced four new appointments. Orbie Bostick has been promoted to manager of commercial and industrial sales. Named to succeed Mr. Bostick as chief industrial engineer is F. Richmond Chadwick, Jr. G. F. Edwards has been named manager of the company's Atlanta division. Completing the list of appointments is Joe Elliott's promotion to residential sales supervisor for the Atlanta division.

The Berkshire Gas Co. has promoted three men within the organization. Remington Merry has been named to the newly created position of Pittsfield division manager. Phillip L. Taylor has risen to the post of manager of the North Adams division, and Donald S. Inglis is now manager of the Greenfield division.

Robert L. Essman has been appointed to the position of assistant director of sales and utilization of the Central Electric & Gas Co., with headquarters in the com-

pany's general office in Lincoln, Nebraska.

Central Illinois Light Co. has announced several changes. Duane A. Cullinan and Walter V. McAdoo were elected to the board of directors of the company. Other directors re-elected by stockholders were: H. S. Eberhard, G. L. Luthy, H. J. Neumiller, and R. J. Saner. The above-mentioned men are not officers of Central Illinois. However, also re-elected as directors were the following officers of Central Illinois Light Co.: W. W. Babcock, G. W. Hathway and Q. W. Wellington. Finally, CILCO's board of directors re-elected the following company officers for the coming year: Q. W. Wellington, vice president, operations; E. W. Stone, vice president, Peoria division manager; H. D. Feltenstein, Jr., vice president, public relations and sales; H. A. Blair, comptroller and secretary; R. J. Kelley, treasurer; A. J. Peterson, assistant treasurer; J. V. Miller, assistant comptroller and assistant secretary; and R. L. Ashley, assistant secretary and assist-

ant comptroller

Evan D. Adams has been named personnel director of The East Ohio Gas Co. Equitable Gas Co. has appointed Oscar C. Cornett director of purchases.

Several new appointments have been announced by Lone Star Gas Co. W. T. Eaton has been named manager of the company's Ranger customer service office. H. E. Lawson is now manager of the company's Childress district of distribution. He succeeds Doyle C. McKinney, who has been transferred to Grand Prairie where he will serve as district manager. Billy Joe Thompson now has the title of local manager of the firm's distribution operations in Wellington. He succeeds T. E. Holley, who will become district manager for Lone Star at Ballinger. Rounding out the list of appointments is the name of C. L. Neves, now administrative assistant to Joe C. Durrow, vice president-distribution.

John C. Bolender has joined North Shore Gas Co. as manager of operation.

A. Newell Robb has risen to the position of sales manager of Portland Gas Light Co. Appointment of Harry L. Lepape as assistant counsel of Southern Counties Gas Co. has been announced. Creation of a new post, director, new construction marketing, and the appointment of George H. Clayton to fill the position was also announced by Southern Counties. Replacing Clayton as San Gabriel Valley division sales manager will be W. D. Simonsen, who has been division sales manager in Southern Counties' Santa Barbara division. Simonsen, in turn, will be replaced in Santa Barbara by Wayne Nelson, who has been staff representative for new construction in Southern Counties' staff offices in Los Angeles. W. J. Altpeter will move up into Nelson's former position.

W. H. VandeHei will become manager of the Oshkosh division of Wisconsin Public Service Corp., July 1. VandeHei, now manager of the southern district of the Wausau division of public service, will be succeeded in his present post by R. B. Fick.

MANUFACTURER

Ray C. Compton has joined Caloric Appliance Corp. as division manager of the gas appliance firm's Great Lakes sales division.

Frederick J. Laughna has been named as Chrysler Airtemp's director of sales and

distribution. This post was vacated when T. W. Kirby was promoted to vice president-marketing.

C. E. Ruelle has been appointed sales coordinator for the appliance division of Hamilton Manufacturing Co.

John H. Owen has been named to the board of directors of Harper-Wyman Co.

The Maytag Co. has added Louise Purdy to its staff as a home economist.

Eldon E. Carlson has been appointed western product manager for Rockwell Manufacturing Co.'s petroleum & industrial meter division.

The appointment of Richard A. Cox as an area manager for Whirlpool Corp.'s dealer development program has been announced.

Paul R. Des Jardins has been appointed manager, engineering planning by Worthington Corp.

OTHER

Three new positions have been created at the Institute of Gas Technology, affiliate of Illinois Institute of Technology. Named managers in charge of all research in their respective areas are J. M. Reid, engineering research and development; W. G. Bair, pilot plant operations and E. B. Shultz, Jr., energy and chemical conversion research.

Jim Hayes has joined the National LP-Gas Council as Midwest field representative.

Mr. Gallucci's firm laid the pipeline across the Hudson River Narrows to Brooklyn in 1952, to bring natural gas from Texas for The Brooklyn Union Gas Company.

Mr. Gallucci had been president and chief executive officer of the pipeline firm for 20 years. He was also president and founder of East Coast Pipeline Company, Inc.

He is survived by his wife, Lillian, a stepson and stepdaughter, and two brothers.

Michael J. Harper



M. J. Harper

vice president of Rockwell Manufacturing Co. died in March.

Mr. Harper was a veteran of 39 years with Rockwell. He joined the company in 1922 as a salesman, and was New York district sales manager for 29 years. He was promoted to eastern regional manager of sales—meter and valve division in 1951, and

in 1953 was elected a vice president.

During the past few years Mr. Harper served as a consultant and handled sales promotion and special assignments.

Mr. Harper was active for many years in A. G. A., in the New Jersey Gas Association, the Society of Gas Operators of New York, the New England Gas Association and the Guild of Ancient Suppliers. His dinners for the A. G. A. Operating Section given during the annual conferences each year had become a gas industry institution.

CONVENTION CALENDAR

1961

MAY

- 15-17 •A. G. A. Midwest Regional Gas Sales Conference, Edgewater Beach Hotel, Chicago, Ill.
- 17-19 •Pennsylvania Gas Association, Annual Meeting, Pocono Manor Inn, Pocono Manor, Pa.
- 18-19 •A. G. A. Financial Forum, Valley Ho Hotel, Phoenix, Ariz.
- 25-26 •Gas & Petroleum Association of Ontario, Annual Meeting, London, Ontario, Canada
- 25-26 •A. G. A. Operating Section, Transmission Conference, Brown Palace and Cosmopolitan Hotel, Denver, Colo.

JUNE

- 5-6 •A. G. A. Eastern Regional Sales Conference, Pittsburgh Hilton Hotel, Pittsburgh, Pa.
- 6-8 •Appalachian Underground Corrosion Short Course, West Virginia University, Morgantown, W. Va.
- 11-13 •Wisconsin Utilities Association, Accounting Conference, Dell View Hotel, Lake Delton, Wis.
- 13-14 •National Safety Council Public Utilities Section, Executive Committee, Laurentian Hotel, Montreal, Quebec, Canada
- 20-24 •Canadian Gas Association, 54th Annual Meeting, Banff Springs Hotel, Banff, Alberta, Canada
- 26-28 •American Society for Heating, Refrigerating & Air Conditioning Engineers, Annual Meeting, Denver, Colo.
- 26-27 •Michigan Gas Association, Annual Meeting, Grand Hotel, Mackinac Island, Mich.
- 26-30 •Second Energy Institute, The American University, Washington, D. C.
- 27-30 •American Home Economics Association Annual Convention, Cleveland, Ohio
- 28 •Eighth International Gas Conference, Stockholm, Sweden

SEPTEMBER

- 11-13 •Annual Accident Prevention Conference, Statler Hilton Hotel, Dallas, Texas
- 13-15 •Pacific Coast Gas Association Convention and Annual Meeting, Coronado Hotel, Coronado, Calif.

OBITUARY

Edward C. Baumann



E. C. Baumann

safety engineer for Public Service Electric & Gas Company, N. J., died April 8.

Mr. Baumann had been with Public Service for 23 years. Joining the company in 1938 as sales representative, he was transferred four years later to the safety education department, and in 1953 became safety engineer

in the gas department.

Mr. Baumann was an active member for many years on the A. G. A. Accident Prevention Committee, and recently served as chairman of the committee. He was also a member of the American Society of Safety Engineers.

Mr. Baumann is survived by his wife, Lois, and three daughters.

Victor E. Gallucci

president of Samuel E. Gallucci & Sons, Inc., pipeline construction company, died April 10.

Personnel service

Betty Jacobsen, Editor

SERVICES OFFERED

Engineering and Management—12 years experience in design, operations, construction, and maintenance of transmission and distribution facilities. Also experienced in meter shop operation, measurement and customer service training. Present position as operations manager. Prefer locating in Midwest. Complete resume upon request. 2018.

Manufacturing Management—one of the nation's largest manufacturers of central heating and air conditioning equipment wishes to help exceptionally capable executive who must relocate. Steady progression through positions of increasing responsibility over the past 13 years has given him a broad experience in all phases of manufacturing management. A strong administrator with heavy line experience. Age 41. 2019.

Management, Operations Engineer—25 years distribution and production management for four gas properties of 60,000 customers. Capable of full charge of medium property. Well versed in natural gas, public, customer, and employee relations, leakage control (also Conseal), corrosion control, Hasche and propane peak shaving, system layouts, L.P. and natural gas operations, accounting, billing, budgeting. College, excellent health, age 55. 2020.

Individual with 25 years supervisory experience with major gas company desires Operational or Construction Work with gas company or company associated with gas industry. Any position considered, if experience and talents can be utilized. Outstanding record in general operations, measurement, air conditioning sales and service, gas utilization and odorization. 2021.

Management in Sales, Promotion, or Advertising—experience encompasses aforementioned. Age 37. Seek utility. Resume upon request. 2022.

Consultant—executive with 30 years' experience available to act as consultant to companies starting to distribute natural gas. Experience covers metering from residential to purchase gas. Regulating gas pressures from high pressure to intermediate, to low pressure distribution pressures. Odorization in all its phases and controls. Twenty years' experience in organizing programs for "job descriptions, classifications and evaluation." 2023.

POSITIONS OPEN

Manufacturers Representative—to sell gas radiant heating system, 100 per cent infrared at 2000F. to metalworking industry for heat treating and processing Temperatures 300-2300F. Outstanding five-year history of wide acceptance by industry. Territories open in New England, New York, Philadelphia, Dallas, Milwaukee. Replies kept in confidence. Straight commission. 0969.

Manufacturers Representative—experienced in selling space heating. New application of

proven design with "no flame-out" feature infrared gas heater. For shopping centers, airports, racetracks, hangars, snow and ice removal. Nationwide territories available. Send full details. Replies held in confidence. Straight commission. 0970.

Manufacturers Representative—to sell processing industry new type gas ovens using infrared heating. Design includes new fan for rapid and uniform distribution of heat. Ideal for heat processing glass, enamel, food, paper, textile. Straight commission. Replies held in confidence. Send details. Territories open throughout U. S. and Canada. 0971.

Manager, Gas Distribution—experienced manager needed to assume full responsibility of sales and operations for Gulf Coast property. A minimum of five years directly related experience is required. Submit resume in confidence. 0972.

Excellent Opportunity—open for young man, research minded; demonstrated or potential sales ability to represent national marketing research organization in utility and publishing fields. Must be intelligent, educated and possess initiative. Position is a training step for top job. Salary to start \$6-8,000. 0973.

Graduate Engineer—for "inside" technical sales training desired by engineering division of eastern manufacturer of industrial gas and oil burners. Potential sales engineer, age 25 to 35 desired. Experience with industrial burner application or associated equipment, i.e., industrial furnaces preferred. Contact W. N. Robertson, Hauck Manufacturing Co., 124 Tenth St., Brooklyn, N. Y. 0974.

Sales Representatives—Florida natural gas utility has several immediate openings for individuals experienced and interested in commercial, residential and appliance sales. Age not factor provided applicant is in good health, successful sales background. These positions provide a base salary, car allowance and liberal commissions. Submit details of education and experience in reply. 0975.

Sales Representatives—excellent opportunity for aggressive sales organization with background in gas-fired hydronic heating and cooling equipment now calling on jobbers, contractors, architects, builders and utilities. Able to organize sales meetings and render technical field service. Territory open—Alaska. 0976.

Engineer, Gas Operations—graduate chemical, civil or mechanical engineer interested in the field of gas purchase, distribution and utilization. Duties involve engineering, operation and supervisory activities for an aggressive Southern New England natural gas company. Write stating age, experience and salary expected. 0977.

Industrial Sales Engineer—permanent services in western utility converting to natural gas. Engineering degree preferred with experience in industrial, commercial, and central house heating sales and installations. Send full resume and photograph to: D. M. Pritchett, 550 California St., San Francisco 4, Calif. 0978.

A. G. A. lists new publications

RESEARCH

• Design Factors of Gas Heating Appliances for More Effective Use of Heat Exchanger Surface, Research Bulletin 86, by D. W. DeWerth and R. E. Smith. \$2.50. Cat. no. 138/DR.

• Effect of Cyclic Temperature on the Life of Domestic Gas Appliance Heat Exchangers, Research Report, by A. R. Hunter and G. M. McClure. \$1.50. Cat. no. 139/DR.

• Development of an Odor Measurement Technique for Domestic Gas Incinerators, Research Report, by R. A. Duffee, H. G. Schutz and H. W. Ray. \$1. Cat. no. 140/DR.

OPERATING

• Gas Leak Survey by means of a Survey Unit, by E. R. Thomas. 25 cents. Cat. no. DMC/56-7.

PROMOTION

• 140,000 Tons of Gas Air Conditioning Installed During 1960. Special survey. 10 cents. Cat. no. 88/P.

STATISTICS

• Monthly Bulletin of Utility Gas Sales, January 1961. \$1. per year by subscription. Cat. no. 60/S-61-1.

• Report of Subcommittee on Accelerated Processing of Rate Changes. Herrman (1957). New Supply, \$1. Cat. no. 1/S.

A. G. A. advisory council

E. J. BOOTHBY.....Washington, D. C.
F. D. CAMPBELL.....Cambridge, Mass.
O. S. CARPENTER.....Houston, Texas
MARVIN CHANDLER.....Aurora, Ill.
C. E. CLOUD.....Little Rock, Ark.
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C. V. COONS.....New York, N. Y.
STUART COOPER.....Wilmington, Del.
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H. WILLIAM DOERING.....Springfield, Mass.
C. H. GUEFFROY.....Portland, Ore.
L. C. HARVEY.....Syracuse, N. Y.
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ROBERT A. HORNBY.....San Francisco, Calif.
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D. H. MITCHELL.....Hammond, Ind.
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E. A. NORMAN.....Columbus, Ohio
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W. F. ROCKWELL, JR.....Pittsburgh, Pa.
E. H. TOLLEFSON.....New York, N. Y.
G. F. WATERS.....Syracuse, N. Y.
J. THEODORE WOLFE.....Baltimore, Md.
D. K. YORATH.....Edmonton, Alta., Canada

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General Promotional Planning Committee
Chairman—Frank M. Foster, Southern California Gas Co., Los Angeles, Calif.

General Research Planning Committee
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General Public Information Planning Committee
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LABORATORIES MANAGING COMMITTEE

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APPROVAL REQUIREMENTS COMMITTEE

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 Man. Dir.—W. H. Dalton, 2532 Yonge St., Toronto, Ontario

GAS APPLIANCE MANUFACTURERS ASSOCIATION

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 Man. Dir.—Harold Massey, 60 East 42nd St., New York, N. Y.

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Pres.—Carl D. Rees, Northern Indiana Public Service Co., Hammond, Ind.
 Sec. Tr.—R. A. Steele, Citizens Gas & Coke Utility, 2020 N. Meridian St., Indianapolis, Ind.

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Pres.—William S. Moore, Eastern Shore Public Service Co., Salisbury, Md.
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Sec.—Dipl. Ing. Erich Klement, Vienna, Austria

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Pres.—Dr. Ing. R. Riedl, Prague, Czechoslovakia
 Sec.—Ing. J. Lenc, Prague, Czechoslovakia

DANISH GAS TECHNICAL ASSOCIATION

Pres.—Richard Jakobsen, A/S Strandvejs-Gasværket, Hellerup, Denmark
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Pres.—H. S. Cheetham, Woodall-Duckham House, London, England
 Sec.—W. T. K. Braunholtz, 17 Grosvenor Crescent, London, S.W.1, England

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 Dir. Gen.—Dr. Guido Randone, Via L. Bissolati 76, Rome, Italy

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Pres.—A. V. Brashear, Michigan Consolidated Gas Co., Detroit, Mich.
 Sec. Tr.—M. G. Kendrick, Michigan Consolidated Gas Co., Detroit, Mich.

MID-WEST GAS ASSOCIATION

Pres.—J. S. Mayer, Northern States Power Co., Minneapolis, Minn.
 Sec. Tr.—James J. Finnegan, 1163 Northwestern Bank Bldg., Minneapolis, Minn.

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 Man. Dir.—Clark Belden, 10 Newbury St., Boston, Mass.

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 Sec. Tr.—Ralph E. Martin, New Jersey Natural Gas Co., Asbury Park, N. J.

PACIFIC COAST GAS ASSOCIATION

Pres.—H. G. Dillin, San Diego Gas & Electric Co., San Diego, Calif.
 Man. Dir.—Robert D. Scott, 870 Market St., San Francisco, Calif.

PENNSYLVANIA GAS ASSOCIATION

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 Gen. Sec.—R. H. Touwaide, 4 Ave. Palmerston, Brussels 4, Belgium

THE JAPAN GAS ASSOCIATION

Pres.—Hirotsoshi Honda, Tokyo Gas Co., Tokyo, Japan
 Gen. Sec.—Eiichiro Ishikawa, 20, 1-chome, Honshiba, Minato-ku, Tokyo, Japan

THE NATIONAL GAS ASSOCIATION OF AUSTRALIA

Pres.—V. M. Bunyan, The Geelong Gas Co., Geelong, Victoria, Australia
 Sec.—J. M. H. Hill, 596 Little Bourke St., Melbourne, C. 1, Australia

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Pres.—Don Daniel Suarez Candeira, Madrid, Spain

THE NETHERLANDS GAS ASSOCIATION

Pres.—Dr. H. D. Tjeenk Willink, Zutenseweg 2, Deventer, Netherlands
 Sec.—J. H. Steinkamp, Jac de Graefflan 1, sGravenhage, Netherlands

NORWEGIAN GAS ASSOCIATION

Pres.—W. Eckhoff, Oslo, Norway
 Sec.—Leif Madsen, Norske Gassverkers Forening, Stavanger, Norway

POLISH ASSOCIATION OF ENGINEERS AND SANITARY TECHNICIANS

Sec. Gen.—Ing. Wacław Nowicki, Warsaw, Poland

ROYAL BELGIAN GAS ASSOCIATION

Pres.—Fernand Rombouts, 4 Avenue Palmerston, Brussels 4, Belgium
 Sec.—R. H. Touwaide, 4 Avenue Palmerston, Brussels 4, Belgium

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Pres.—James E. Coleman, The Manufacturers Light & Heat Co., Pittsburgh, Pa.
 Sec. Tr.—P. L. Kesel, Carnegie Natural Gas Co., Pittsburgh, Pa.

ROCKY MOUNTAIN GAS ASSOCIATION

Pres.—Norman F. Patrick, Bell Plumbing & Heating Co., Denver, Colo.
 Sec. Tr.—H. P. Risley, Public Service Company of Colorado, Denver, Colo.
 Field Sec.—Roy G. Munroe, Rm. 16, 1300 Glenarm St., Denver, Colo.

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 Sec. Tr.—Edward W. Ruggles, North Carolina State College, Raleigh, N. C.

SOUTHERN GAS ASSOCIATION

Pres.—H. A. Eddins, Oklahoma Natural Gas Co., Tulsa, Okla.
 Man. Dir.—Robert R. Suttle, 1524 Life of America Building, Dallas, Texas

WISCONSIN UTILITIES ASSOCIATION

Pres.—Harry I. Miller, Wisconsin Public Service Corp., Milwaukee, Wis.
 Man. Dir.—Dale F. Hansman, Empire Building, Suite 522, 710 North Plankinton Ave., Milwaukee, Wis.

SCIENTIFIC ASSOCIATION OF ENGINEERS AND TECHNICIANS OF ROMANIA

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